

IAM

IAM stands for identify & access management; this refers to policies, processes & technologies used to manage identity & access of resources & services within an organization. This is designed to ensure that only authorized users/groups can access the sensitive data/ application / platform. This helps us to prevent unauthorized access & misuse of any data or services. This manages users & their level of access to AWS console & the resources. This is very important according to the administration point of view in which the user is given different access.

These permissions are further divided into 4 types:

- 1) Centralized
- 2) Access.
- 3) Permission
- 4) Identity.

- 1) **Centralized**

It gives you centralized control over your AWS account.

- 2) **Access**

It also gives shared access to your account.

- 3) **Permission**

This gives you granular permission, this means that users can have different levels of access. Different users will have different levels of access within the same organization.

- 4) **Identity federation**

This enables the user to login using their credentials stored in active directory, facebook, linkedin, google.

Multi-factor authentication : User is granted access only after successful completion of multiple independent authentication mechanisms. For eg. When users provide username & password this works as one set of authentication mechanisms & the second level of authentication is via google authenticator where a token is generated as password.

Temporary access : It also provides temporary access for user or device and service for example if you develop a mobile or web based application you can

configure the user to have temporary access to resources within your account for example to enable access to retrieve data located in S3 bucket or in DynamoDB.

Password rotation policy: This allows you to set up your own password.

Integrated : It is integrated with different AWS services.

Compliance : Supports PCI DSS compliance.

These were some features of IAM.

The key terminology that are used in **IAM** are -

User: The users are referred to as end users who have logged in into the AWS console & they are also interacting in the AWS by running API commands.

Groups: The group are collection of users that are grouped together with common set of permissions suppose you work in a marketing team & you need to access (Read & write) certain files that are stored in **S3** buckets, we need to specify specific set of permissions for all the users that are working in marketing department. Once you create a group you need to add a specific user into that group which will have a similar set of permissions.

Roles: We can create a set of roles, we can assign them to user applications or services to give access to AWS resources. So role is used to define a set of permissions for ex. S3 bucket access, dynamo DB access to database admin.

Policy: Policies are made up of documents called policy documents, these documents are in a format that is called JSON & they give permission to which user, group, role will access which resources.

IAM : Policy simulators check for the authentic users, these are authorized to run the resources. Test policies that are attached already to existing user groups, it is the best way to check any suspected IAM user group.

Click on : **Add MFA**

The screenshot shows the AWS IAM dashboard. On the left is a navigation sidebar with sections like 'Access management' and 'Access reports'. The main content area is titled 'IAM dashboard' and includes 'Security recommendations', 'IAM resources' (a table showing 0 user groups, 0 users, 2 roles, 0 policies, and 0 identity providers), and 'What's new'. On the right, the 'AWS Account' section displays account details like ID and alias. A yellow circle highlights the 'Add MFA' button in the 'Security recommendations' section, which is associated with the recommendation 'Add MFA for root user'.

Click on : **Assign MFA**

The screenshot shows the 'My security credentials (root user)' page in the AWS IAM console. It includes a warning banner stating 'MFA not activated for root user' with an 'Assign MFA' button highlighted in a yellow circle. Below this is the 'Account details' section showing account name, email, and ID. The 'Multi-factor authentication (MFA)' section shows '0' devices and an 'Assign MFA device' button. At the bottom, the 'Access keys' section has a 'Create access key' button.

1) Add device name :

2) Scroll down.

3) Click on **next**

Device name

Enter a meaningful name to identify this device.

YB

Maximum 128 characters. Use alphanumeric and '+ = , . @ - _ ' characters.

Select MFA device [Info](#)

Select an MFA device to use, in addition to your username and password, whenever you need to authenticate.



Authenticator app

Authenticate using a code generated by an app installed on your mobile device or computer.



Security Key

Authenticate using a code generated by touching a YubiKey or other supported FIDO security key.



Hardware TOTP token

Authenticate using a code displayed on a hardware Time-based one-time password (TOTP) token.

1st option click on : **see a list of compatible application**

IAM > Security credentials > Assign MFA device

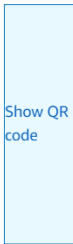
Step 1
Select MFA device

Step 2
Set up device

Set up device

Set up your authenticator app

A virtual MFA device is an application running on your device that you can configure by scanning a QR code.

- 1 Install a compatible application such as Google Authenticator, Duo Mobile, or Authy app on your mobile device or computer.
[See a list of compatible applications](#)
- 2  Open your authenticator app, chose **Show QR code** on this page, then use the app to scan the code. Alternatively, you can type a secret key.
[Show secret key](#)

Fill in two consecutive codes from your MFA device.

1) Install Google Authenticator on your mobile.

2) Click on **: Android / iOS Google Authenticator**

Virtual authenticator apps

Virtual authenticator apps implement the [time-based one-time password](#) (TOTP) algorithm and support multiple tokens on a single device. Virtual authenticators are supported for IAM users in the [AWS GovCloud \(US\) Regions](#) and in other AWS Regions. For more information about enabling virtual authenticators, see [Enabling a virtual multi-factor authentication \(MFA\) device](#).

You can install apps for your smartphone from the app store that is specific to your type of smartphone. Some app providers also have web and desktop applications available. See the following table for examples.

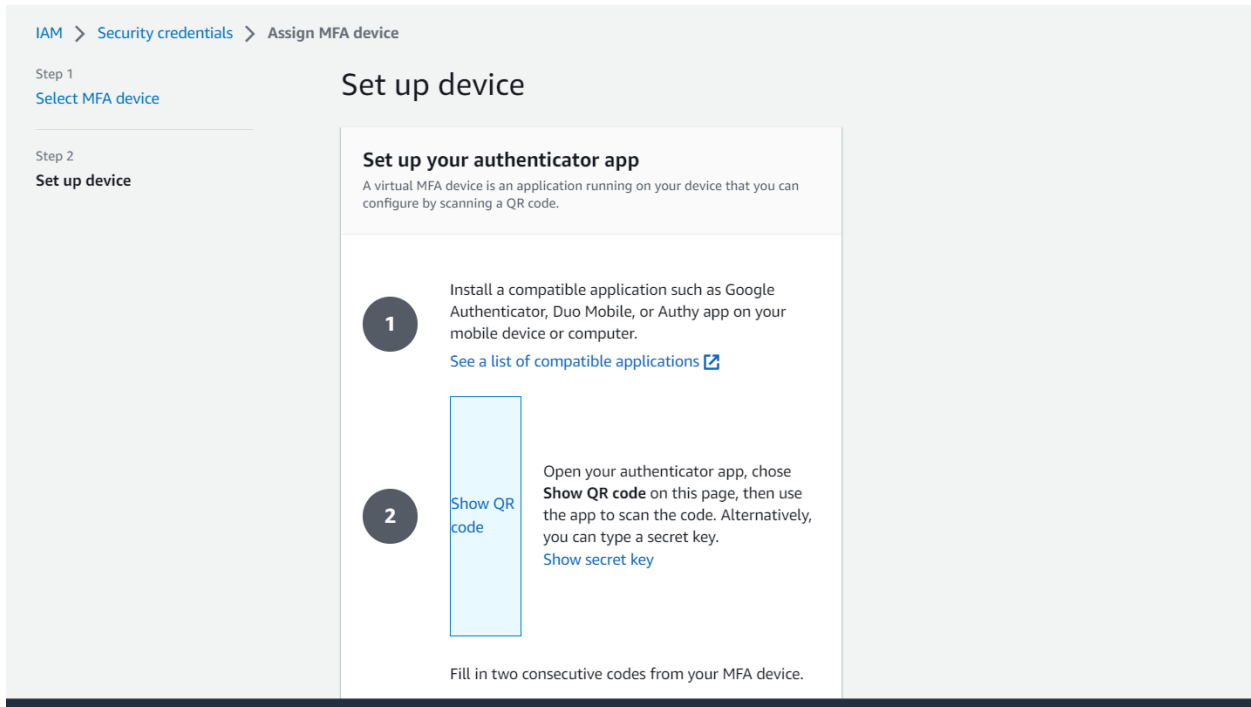
Android	Twilio Authy Authenticator , Duo Mobile , LastPass Authenticator , Microsoft Authenticator , Google Authenticator , Symantec VIP
iOS	Twilio Authy Authenticator , Duo Mobile , LastPass Authenticator , Microsoft Authenticator , Google Authenticator , Symantec VIP



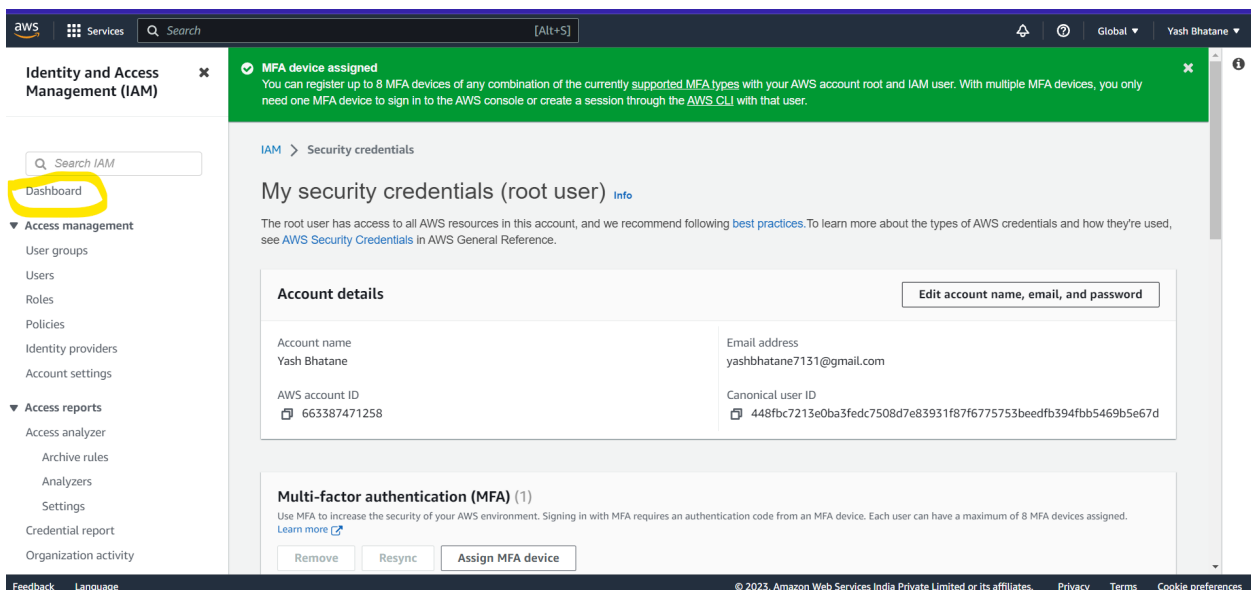
TOTP hardware tokens

Hardware tokens also support the [TOTP algorithm](#) and are provided by Thales, a third-party provider. These tokens are for use exclusively with AWS accounts. For more information, see [Enabling a hardware MFA device](#).

- 1) Click on 2nd option for QR Code
- 2) Scan QR code and fill both codes.
- 3) After click on **ADD MFA**



- 1) This page will appear
- 2) Click on dashboard



Next Page :

The screenshot shows the AWS IAM dashboard. The left sidebar contains the 'Identity and Access Management (IAM)' menu with options like Dashboard, Access management, Access reports, and more. The main content area displays the 'IAM dashboard' with sections for Security recommendations (Root user has MFA, Root user has no active access keys), IAM resources (User groups: 0, Users: 0, Roles: 2, Policies: 0, Identity providers: 0), and What's new. The right sidebar shows the AWS Account information and Quick Links.

Identity and Access Management (IAM)

Search IAM

Dashboard

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- Users
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- Identity providers
- Account settings

▼ Access reports

- Access analyzer
- Archive rules
- Analizers
- Settings
- Credential report
- Organization activity

IAM dashboard

Security recommendations

- ✓ **Root user has MFA**
Having multi-factor authentication (MFA) for the root user improves security for this account.
- ✓ **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

Updates for features in IAM

- Advanced Notice: Amazon S3 will automatically enable S3 Block Public Access and disable access control lists for all new buckets starting in April 2023. 3 months ago
- AWS IAM Identity Center now supports session management capabilities for AWS Command Line Interface (AWS CLI) and SDKs. 4 months ago
- AWS Lambda announces support for Attribute-Based Access Control (ABAC) in AWS GovCloud (US) Regions. 4 months ago
- Amazon ElastiCache simplifies password rotations with Secrets Manager. 4 months ago

AWS Account

Account ID
663387471258

Account Alias
663387471258 [Create](#)

Sign-in URL for IAM users in this account
<https://663387471258.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 permissions for each of the

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Click on : **Users**

This screenshot is identical to the previous one, but with a yellow circle highlighting the 'Users' link in the 'Access management' section of the left sidebar.

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IAM dashboard

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Quick Links

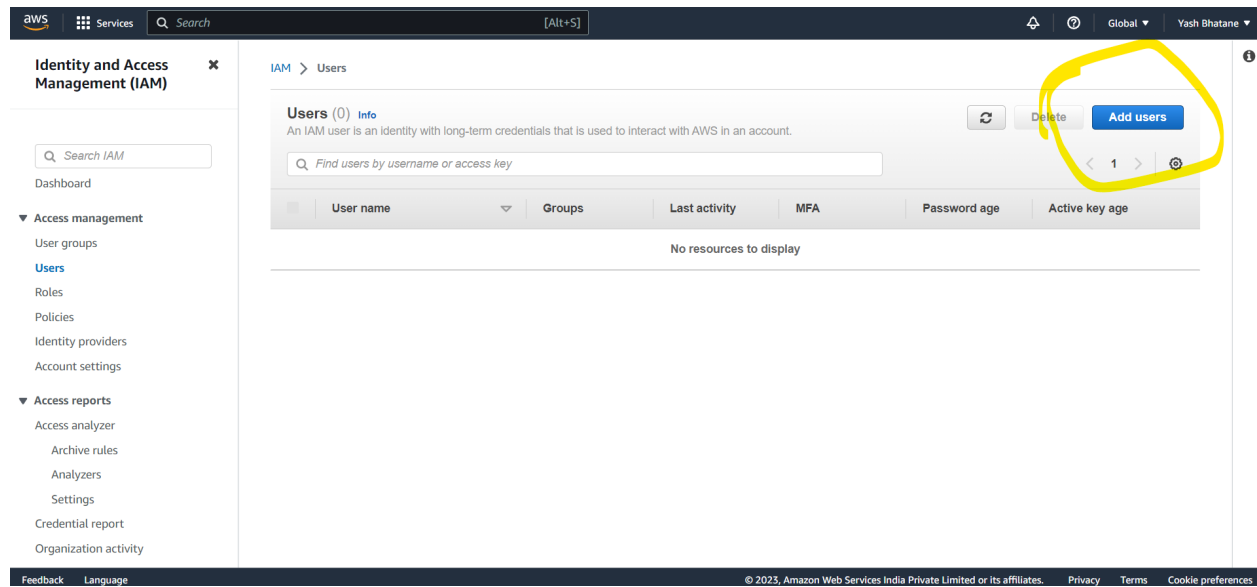
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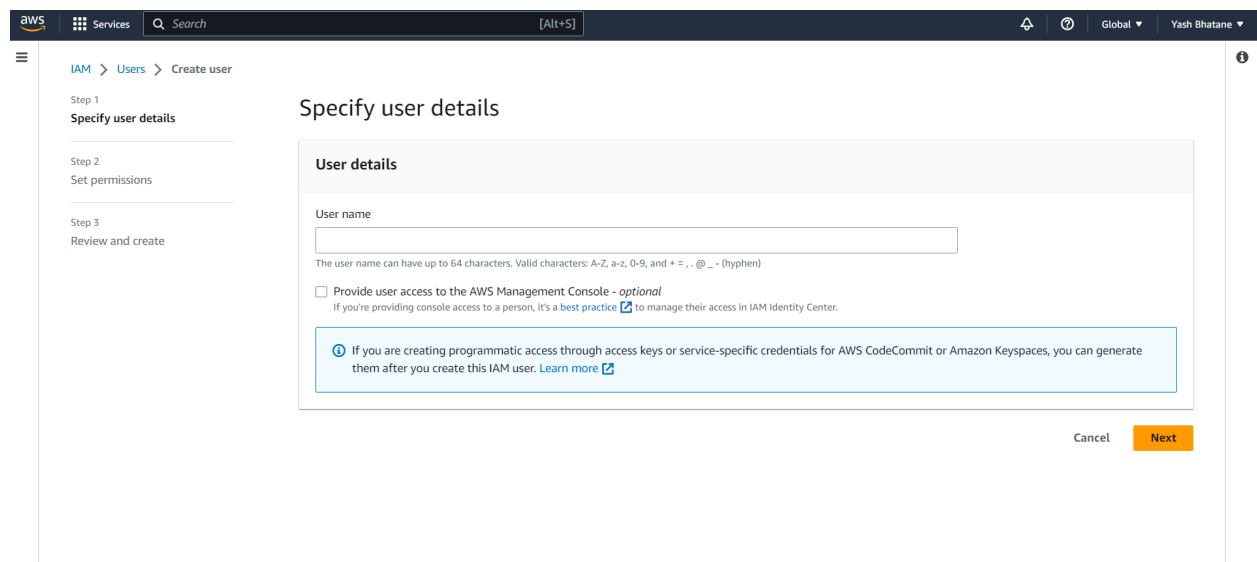
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Click on : **Add Users**

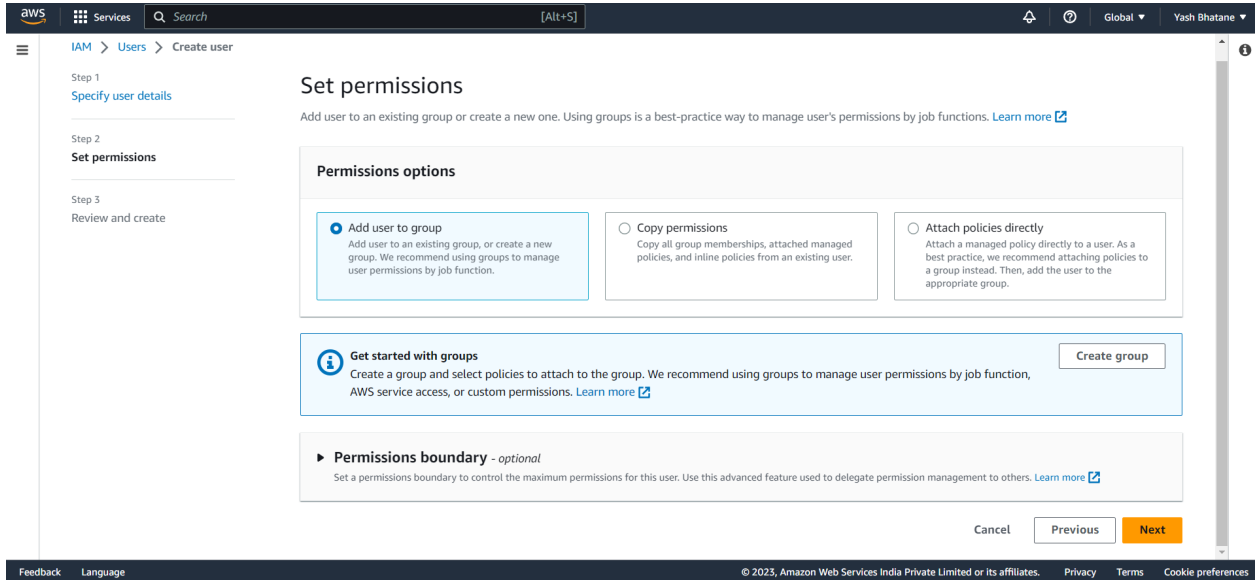
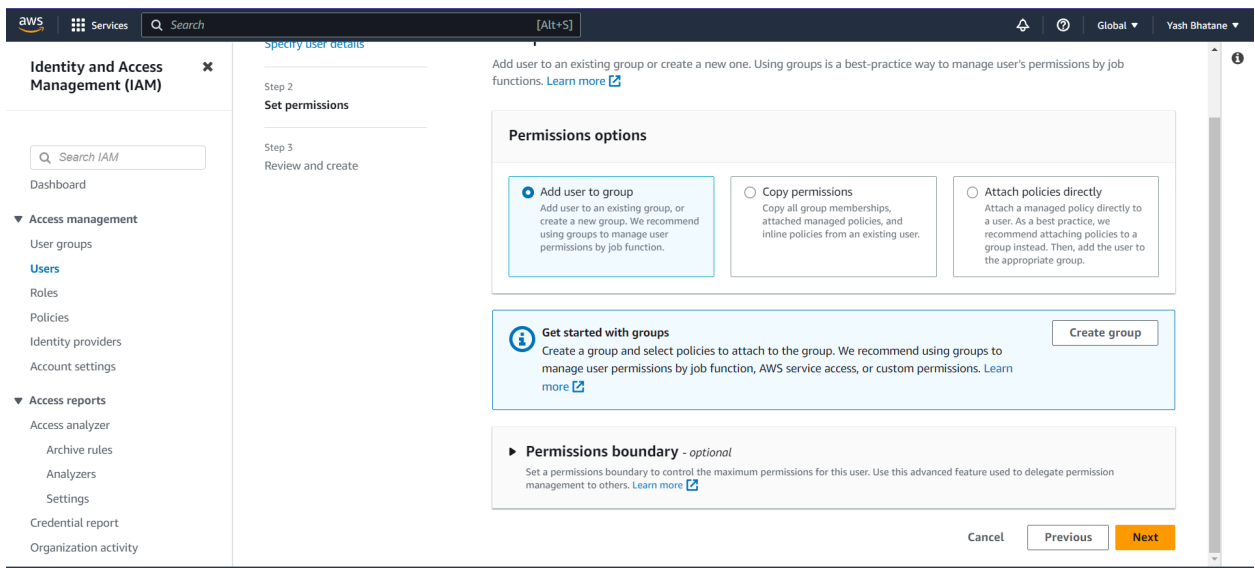


1) Enter user name :

2) Click on **next**



Click on **next**

Click **Next**

- 1) Scroll down
- 2) Click on **Create User**

The screenshot shows the 'Review and create' step of the AWS IAM 'Create user' process. The left sidebar contains the 'Identity and Access Management (IAM)' menu with 'Users' highlighted. The main content area displays the user details: 'User name' is 'yash', 'Console password type' is 'None', and 'Require password reset' is 'No'. Below this is a 'Permissions summary' section with a table showing 'No resources'. The 'Tags - optional' section indicates 'No tags associated with the resource' and includes an 'Add new tag' button. At the bottom right, there are 'Cancel', 'Previous', and 'Create user' buttons.

Name	Type	Used as
No resources		

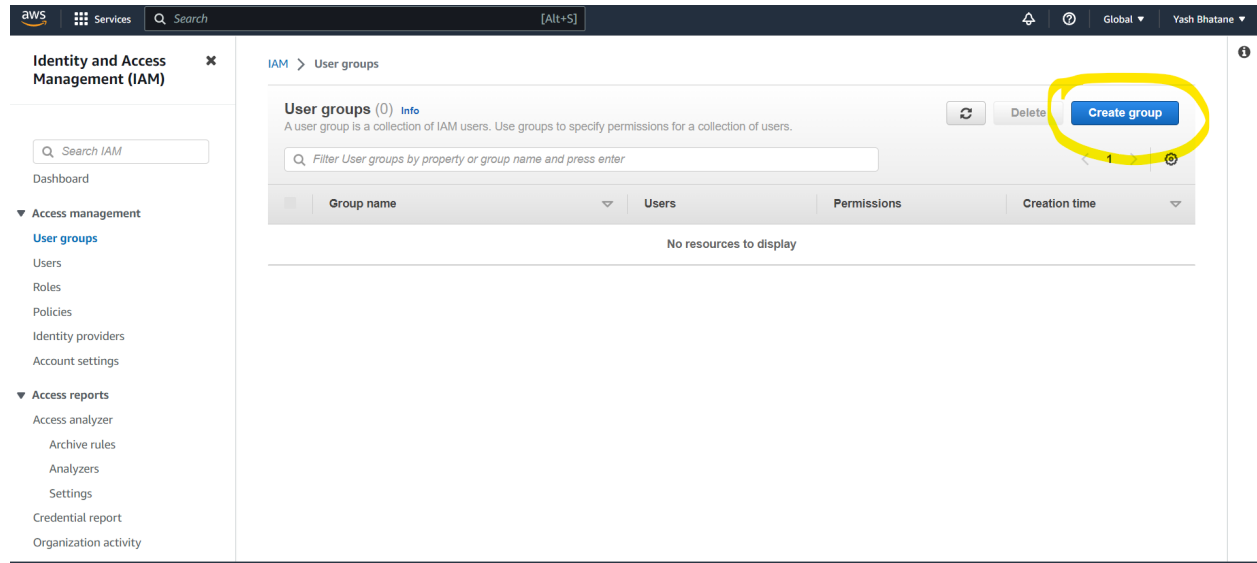
User name	Groups	Last activity	MFA	Password age	Active key age
yash	None	Never	None	None	-

Click on : **User Groups**

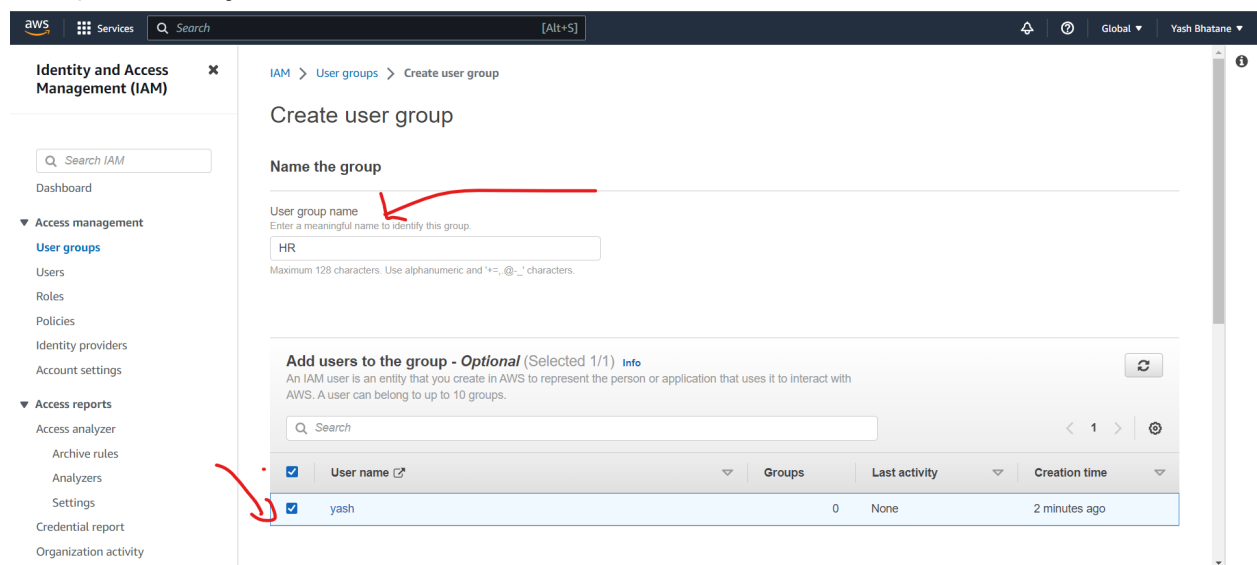
The screenshot shows the 'Users' page in the AWS IAM console. A green banner at the top indicates 'User created successfully'. The left sidebar shows the 'Identity and Access Management (IAM)' menu with 'User groups' highlighted. The main content area displays a table of users. The table has columns for 'User name', 'Groups', 'Last activity', 'MFA', 'Password age', and 'Active key age'. The user 'yash' is listed with 'None' for Groups, 'Never' for Last activity, 'None' for MFA, 'None' for Password age, and '-' for Active key age. There are buttons for 'Add users', 'Delete', and 'View user'.

User name	Groups	Last activity	MFA	Password age	Active key age
yash	None	Never	None	None	-

Click On : **Create Group**



- 1) Enter group name :
- 2) Select your user :



- 1) Search **HR** Permissions here
- 2) Select 1st option

Identity and Access Management (IAM)

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Attach permissions policies - *Optional* (Selected 1/823) [Info](#)

You can attach up to 10 policies to this user group. All the users in this group will have permissions that are defined in the selected policies.

Filter policies by property or policy name and press enter. 6 matches

HR X Clear filters

	Policy name	Type	Description
<input checked="" type="checkbox"/>	ServerMigrationServiceLaunchRole	AWS managed	Permissions to allow the AWS Server Migration Service to create a...
<input type="checkbox"/>	CloudWatchReadOnlyAccess	AWS managed	Provides read only access to CloudWatch.
<input type="checkbox"/>	CloudSearchReadOnlyAccess	AWS managed	Provides read only access to the Amazon CloudSearch configuratio...
<input type="checkbox"/>	AmazonCloudWatchRUMFullAccess	AWS managed	Grants full access permissions for the Amazon CloudWatch RUM s...
<input type="checkbox"/>	AWSAppMeshReadOnly	AWS managed	Provides read-only access to the AWS App Mesh APIs and Manage...
<input type="checkbox"/>	AmazonCloudWatchRUMReadOnlyAccess	AWS managed	Grants read only permissions for the Amazon CloudWatch RUM ser...

Cancel Create group

Click on : **Create group**

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	Policy name	Type	Description
<input checked="" type="checkbox"/>	ServerMigrationServiceLaunchRole	AWS managed	Permissions to allow the AWS Server Migration Service to create a...
<input type="checkbox"/>	CloudWatchReadOnlyAccess	AWS managed	Provides read only access to CloudWatch.
<input type="checkbox"/>	CloudSearchReadOnlyAccess	AWS managed	Provides read only access to the Amazon CloudSearch configuratio...
<input type="checkbox"/>	AmazonCloudWatchRUMFullAccess	AWS managed	Grants full access permissions for the Amazon CloudWatch RUM s...
<input type="checkbox"/>	AWSAppMeshReadOnly	AWS managed	Provides read-only access to the AWS App Mesh APIs and Manage...
<input type="checkbox"/>	AmazonCloudWatchRUMReadOnlyAccess	AWS managed	Grants read only permissions for the Amazon CloudWatch RUM ser...

Cancel Create group

Click on : **Roles**

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HR user group created. View group

IAM > User groups

User groups (1) Info

A user group is a collection of IAM users. Use groups to specify permissions for a collection of users.

Filter User groups by property or group name and press enter

Group name	Users	Permissions	Creation time
HR	1	Defined	10 minutes ago

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Click on : **Create role**

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IAM > Roles

Roles (2) Info

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

Search

Role name	Trusted entities	Last activity
AWSServiceRoleForSupport	AWS Service: support (Service-Linked Role)	-
AWSServiceRoleForTrustedAdvisor	AWS Service: trustedadvisor (Service-Linked Role)	-

Roles Anywhere Info Manage

Authenticate your non AWS workloads and securely provide access to AWS services.

Access from your non AWS workloads

Operate your non AWS workloads using the same authentication and authorization strategy that you use within AWS.

X.509 Standard

Use your own existing PKI infrastructure or use [AWS Certificate Manager Private Certificate Authority](#) to authenticate identities.

Temporary credentials

Use temporary credentials with ease and benefit from the enhanced security they provide.

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Select **EC2**

Step 2
Add permissions

Step 3
Name, review, and create

Trusted entity type

- ☒ **AWS service**
Allow AWS services like EC2, Lambda, or others to perform actions in this account.
- ☐ **AWS account**
Allow entities in other AWS accounts belonging to you or a 3rd party to perform actions in this account.
- ☐ **Web identity**
Allows users federated by the specified external web identity provider to assume this role to perform actions in this account.
- ☐ **SAML 2.0 federation**
Allow users federated with SAML 2.0 from a corporate directory to perform actions in this account.
- ☐ **Custom trust policy**
Create a custom trust policy to enable others to perform actions in this account.

Use case
Allow an AWS service like EC2, Lambda, or others to perform actions in this account.

Common use cases

- ☒ **EC2**
Allows EC2 instances to call AWS services on your behalf.
- ☐ **Lambda**
Allows Lambda functions to call AWS services on your behalf.

Use cases for other AWS services:
Choose a service to view use case

Cancel Next

- 1) Search **S3**
- 2) Select 2nd option

IAM > Roles > Create role

Step 1
Select trusted entity

Step 2
Add permissions

Step 3
Name, review, and create

Add permissions

Permissions policies (Selected 1/823) Info

Choose one or more policies to attach to your new role.

Filter policies by property or policy name and press enter. 9 matches

S3 Clear filters

	Policy name	Type	Description
<input type="checkbox"/>	AmazonDMSRedshi...	AWS m...	Provides access to manage S3 settings for Redshift endpoints for DMS.
<input checked="" type="checkbox"/>	AmazonS3FullAccess	AWS m...	Provides full access to all buckets via the AWS Management Console.
<input type="checkbox"/>	QuickSightAccessF...	AWS m...	Policy used by QuickSight team to access customer data produced by S3 Storage Management Analy...
<input type="checkbox"/>	AmazonS3ReadOnl...	AWS m...	Provides read only access to all buckets via the AWS Management Console.
<input type="checkbox"/>	AmazonS3Outposts...	AWS m...	Provides full access to Amazon S3 on Outposts via the AWS Management Console.
<input type="checkbox"/>	AWSBackupService...	AWS m...	Policy containing permissions necessary for AWS Backup to backup data in any S3 bucket. This inclu...
<input type="checkbox"/>	AWSBackupService...	AWS m...	Policy containing permissions necessary for AWS Backup to restore a S3 backup to a bucket. This inc...

- 1) Enter a meaningful name for role
- 2) Scroll down and click on : **Create role**

aws Services Search [Alt+S] Global Yash Bhatane

IAM > Roles > Create role

Step 1
Select trusted entity

Step 2
Add permissions

Step 3
Name, review, and create

Name, review, and create

Role details

Role name
Enter a meaningful name to identify this role.
S3-full access
Maximum 64 characters. Use alphanumeric, *, =, @, _ characters.

Description
Add a short explanation for this role.
Allows EC2 instances to call AWS services on your behalf.
Maximum 1000 characters. Use alphanumeric and *, =, @, _ characters.

Step 1: Select trusted entities Edit

```
1 {  
2   "Version": "2012-10-17",  
3   "Statement": [  
4     {  
5       "Effect": "Allow",  
6       "Action": [
```

aws Services Search [Alt+S] Global Yash Bhatane

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Step 2: Add permissions

Edit

Permissions policy summary

Policy name	Type	Attached as
AmazonS3FullAccess	AWS managed	Permissions policy

Tags

Add tags - optional [Info](#)

Tags are key-value pairs that you can add to AWS resources to help identify, organize, or search for resources.

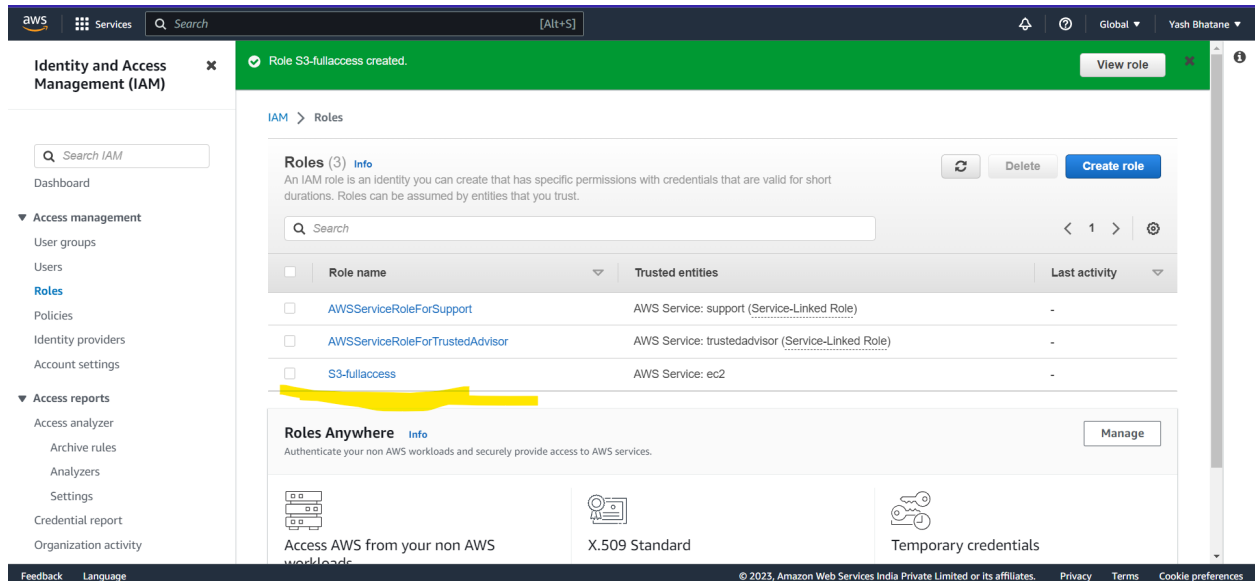
No tags associated with the resource.

Add tag

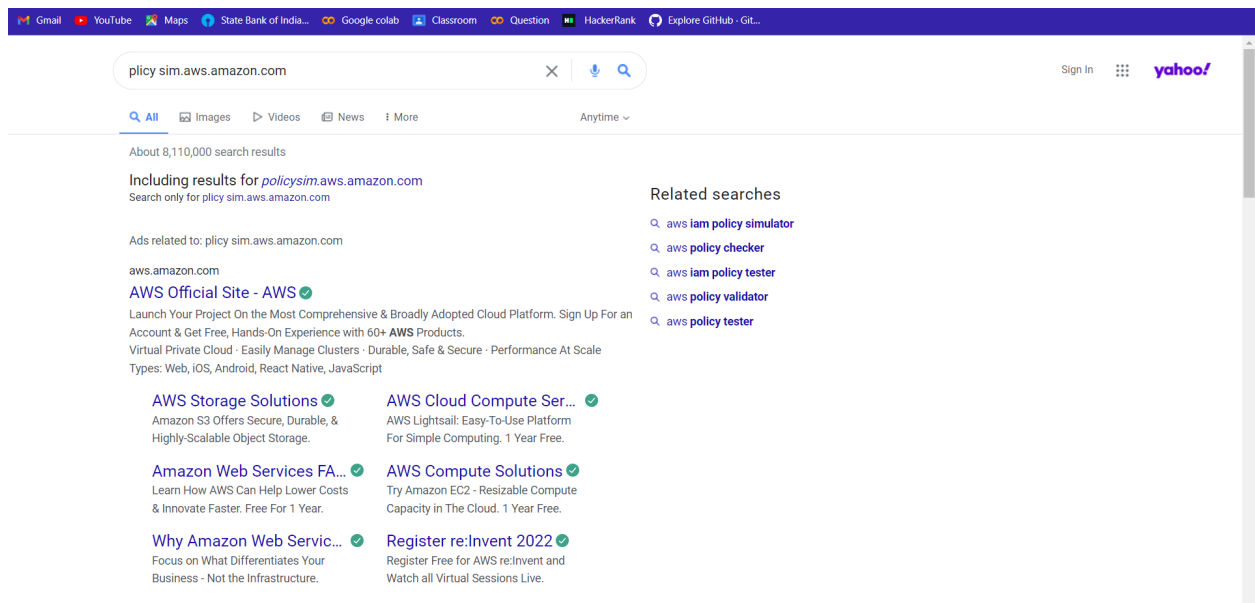
You can add up to 50 more tags.

Cancel Previous Create role

Your role is created.



IAM : Policy simulator check for authentic users, these users are authorized to run the resources. Test policies that are attached to already existing user groups, is the best way to check any suspected IAM user group or permission.



Open this site

docs.aws.amazon.com > IAM > latest ▾

Testing IAM policies with the IAM policy simulator - AWS ... ✓

Open the IAM policy simulator console at: <https://policysim.aws.amazon.com/>. In the Mode: menu at the top of the page, choose New Policy. In the Policy Sandbox, choose Create New Policy. Type ...

Permissions Boundary ✓

AWS supports permissions boundaries for IAM entities (users...

Amazon Web Services Si... ✓

Your account doesn't have permission to use AWS Private...

Click on site

The screenshot shows the AWS IAM policy simulator console documentation page. The page is titled "Using the IAM policy simulator (console)". The left sidebar contains a navigation menu with the following items: "What is IAM?", "Getting set up", "Getting started", "Tutorials", "Identities", "Access management", "Policies and permissions", "Managing IAM policies", "Creating IAM policies", "Validating policies", "Generating policies", "Testing IAM policies", "Add or remove identity permissions", "Versioning IAM policies", "Editing IAM policies", and "Deleting IAM policies". The main content area is titled "Using the IAM policy simulator (console)" and contains the following text: "By default, users can test policies that are not yet attached to a user, user group, or role by typing or copying those policies into the policy simulator console. These policies are used only in the simulation and do not disclose sensitive information." Below this text is a section titled "To test a policy that is not attached to a user, user group, or role (console)" which contains a list of steps: 1. Open the IAM policy simulator console at: <https://policysim.aws.amazon.com/>. 2. In the Mode: menu at the top of the page, choose New Policy. 3. In the Policy Sandbox, choose Create New Policy. 4. Type or copy a policy into the policy simulator, and use the policy simulator as described in the following steps. The right sidebar contains a section titled "On this page" with the following items: "How the IAM policy simulator works", "Permissions required for using the IAM policy simulator", "Using the IAM policy simulator (console)", and "Using the IAM policy simulator (AWS CLI and AWS API)".

docs.aws.amazon.com > IAM > latest ▾

Testing IAM policies with the IAM policy simulator - AWS ... ✓

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Amazon Web Services Si... ✓

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Using the IAM policy simulator (console)

By default, users can test policies that are not yet attached to a user, user group, or role by typing or copying those policies into the policy simulator console. These policies are used only in the simulation and do not disclose sensitive information.

To test a policy that is not attached to a user, user group, or role (console)

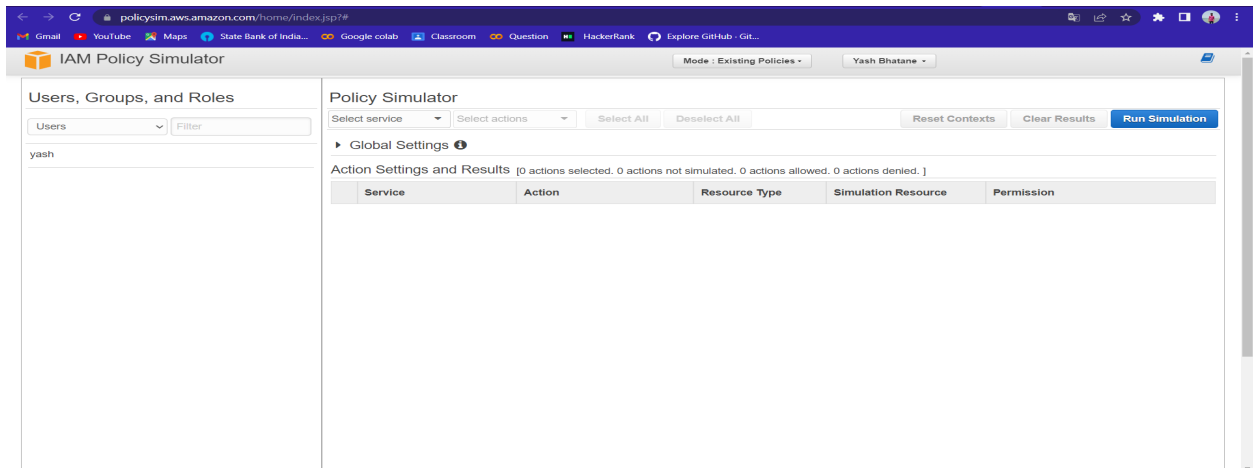
1. Open the IAM policy simulator console at: <https://policysim.aws.amazon.com/>.
2. In the **Mode:** menu at the top of the page, choose **New Policy**.
3. In the **Policy Sandbox**, choose **Create New Policy**.
4. Type or copy a policy into the policy simulator, and use the policy simulator as described in the following steps.

After you have permission to use the IAM Policy Simulator Console, you can use the policy simulator to test an IAM user, user group, role, or resource policy.

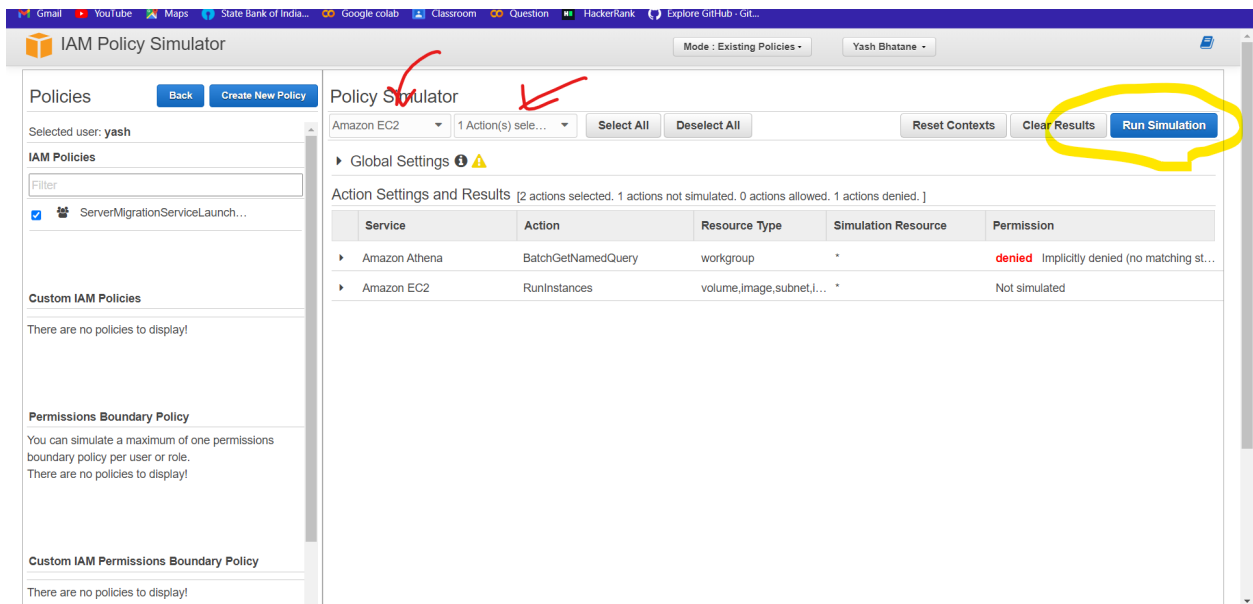
To test a policy that is attached to a user, user group, or role (console)

1. Open the IAM policy simulator console at <https://policysim.aws.amazon.com/>.

Click on your user :



- 1) In select service : **EC2**
- 2) In action select : **RunInstances**
- 3) Click on **Run Simulation**



After Run

The screenshot shows the IAM Policy Simulator interface. On the left, the 'Policies' sidebar is visible with sections for 'IAM Policies' (containing 'ServerMigrationServiceLaunch...'), 'Custom IAM Policies' (empty), 'Permissions Boundary Policy' (empty), and 'Custom IAM Permissions Boundary Policy' (empty). The main 'Policy Simulator' area has a dropdown for 'Amazon EC2' and '1 Action(s) sele...'. Below this, the 'Global Settings' section is expanded. The 'Action Settings and Results' section shows a table with 2 actions selected: 0 not simulated, 1 allowed, and 1 denied.

Service	Action	Resource Type	Simulation Resource	Permission
Amazon Athena	BatchGetNamedQuery	workgroup	*	denied Implicitly denied (no matching st...
Amazon EC2	RunInstances	volume,image,subnet,i...	*	allowed 1 matching statements.

A yellow highlight is present under the 'allowed' status in the second row of the table.

S3 -

S3 simple storage service is a highly scalable secure cloud base storage provided by AWS. It enables individuals and organizations to store and retrieve data/object/file or any kind of unstructured data over the internet globally.

There are three feature :

- 1) **Object storage** : provide secure, durable, highly scalable object storage.
- 2) **Scalable** : It allows the user or organization to store and retrieve data from anywhere and at a very low cost.
- 3) **Simple** :
 - AWS is a web service interface. Here data is managed as an object rather than a file or block. In this we can upload files of any type like photos, videos, text files,pdf,ppt etc.

- It can not be used to run an operating system or database.
- This provides ultimate storage (the total volume of data and object you can store unlimited)
- As we said everything is stored in object format size of object 0bite to 5 terabyte
- S3 bucket stores files in a bucket similarly like folders.
- When you work with S3 bucket the following things you should need to follow.
 1. Universal namespace : As all AWS account S3 namespace each S3 bucket name should be uniq.
 2. When you upload a file to an s3 bucket you will receive an **http** code 200 if uploaded successfully.

S3 stores anything in key value pair :

- **Key** is name of object eg. file.txt
- **Values data** itself which is made up of sequence of byte
- **Version id** is an important entity for storing versions of the same kind of object.
- **Meta data** stores data about data. Eg. last modified