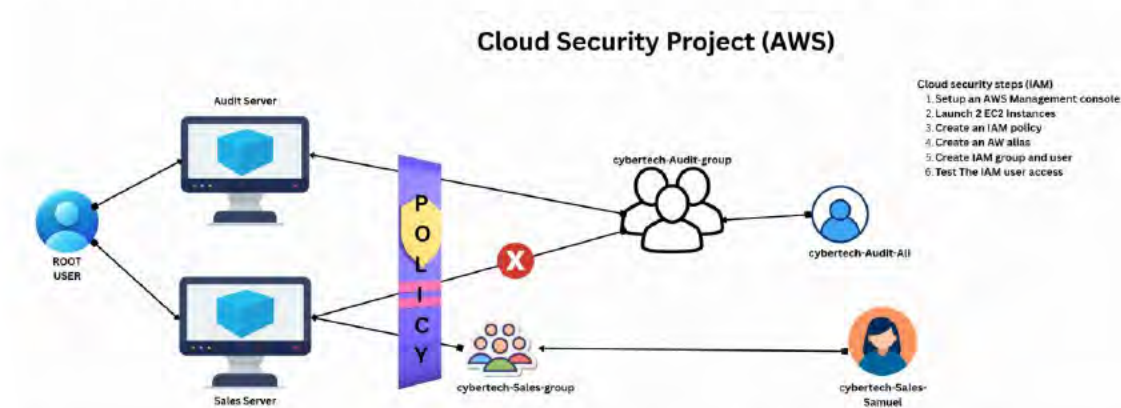


AWS IAM Cloud Security Project

1. Project Overview

I completed this project on cloud security controls in Amazon Web Services (AWS), focusing on Identity and Access Management (IAM). The goal was to create a least-privilege policy, attach it to a user or group, and verify that the policy correctly restricts actions on Amazon EC2 instance.



In this project, we will be creating Users, User groups, buckets, cloudtrails, polices and implementing those policies and verifying them.

Standard practice prescribes that we don't do anything on root user, i.e we do not create EC2, S3 buckets from the root user, however we can use it to create a user with admin privileges. once we are done with this, we log out and go to the login page where we will be given the option to log in as IAM user.. please proceed with this and you can now start creatin all we need from this new login channel

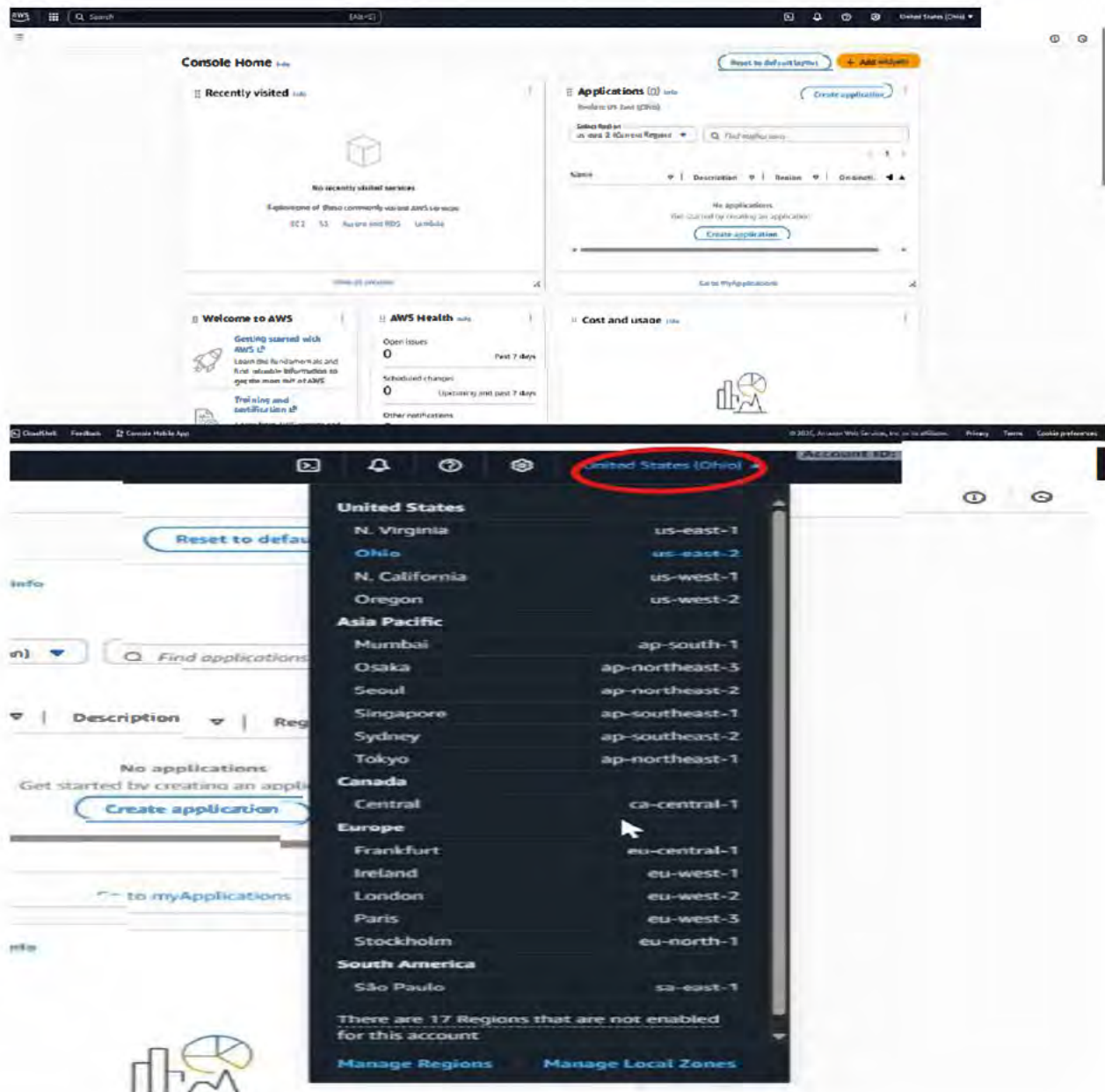
In AWS, we use services to create everything

Firstly we can create an AWS trail account for 6 month on the website at [Cloud Computing Services - Amazon Web Services \(AWS\)](https://aws.amazon.com/cloud-computing/services/), a credit card will be required however you will get a credit to use to run your simulation.

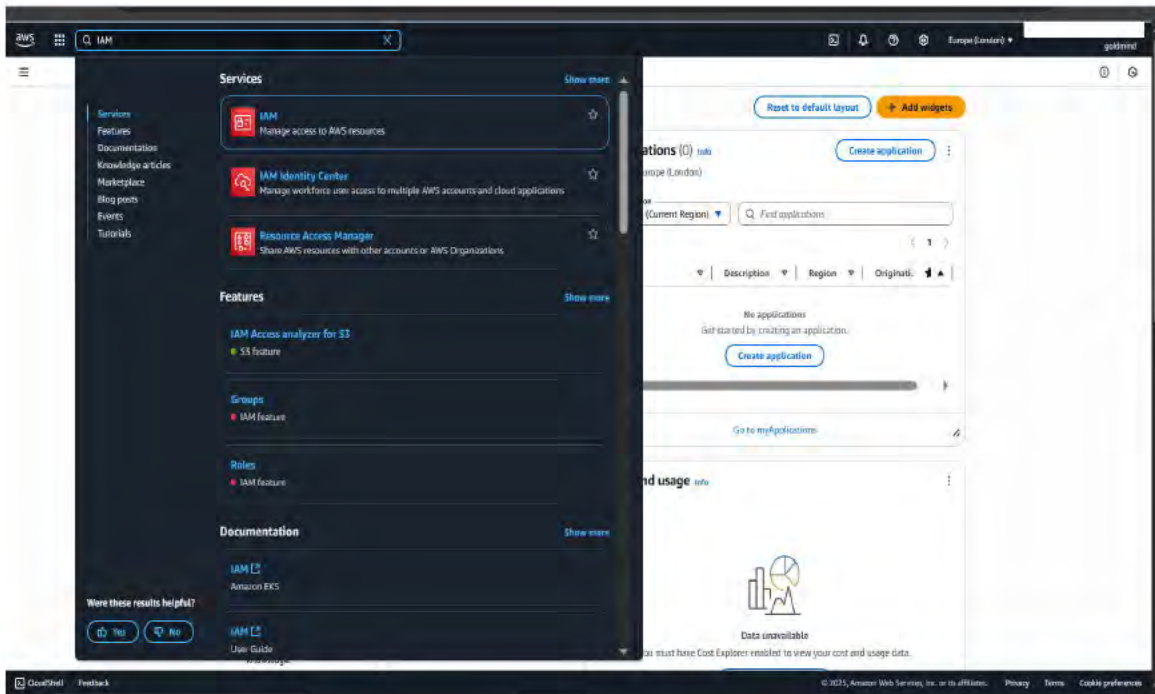
CREATING THE IAM USER AND GROUPS

Upon creating an account and logging in, it will be a root user, so we will set up MFA (to make it secure) and create a user with admin privileges.

Firstly, we need to change our geographical location to our closest location

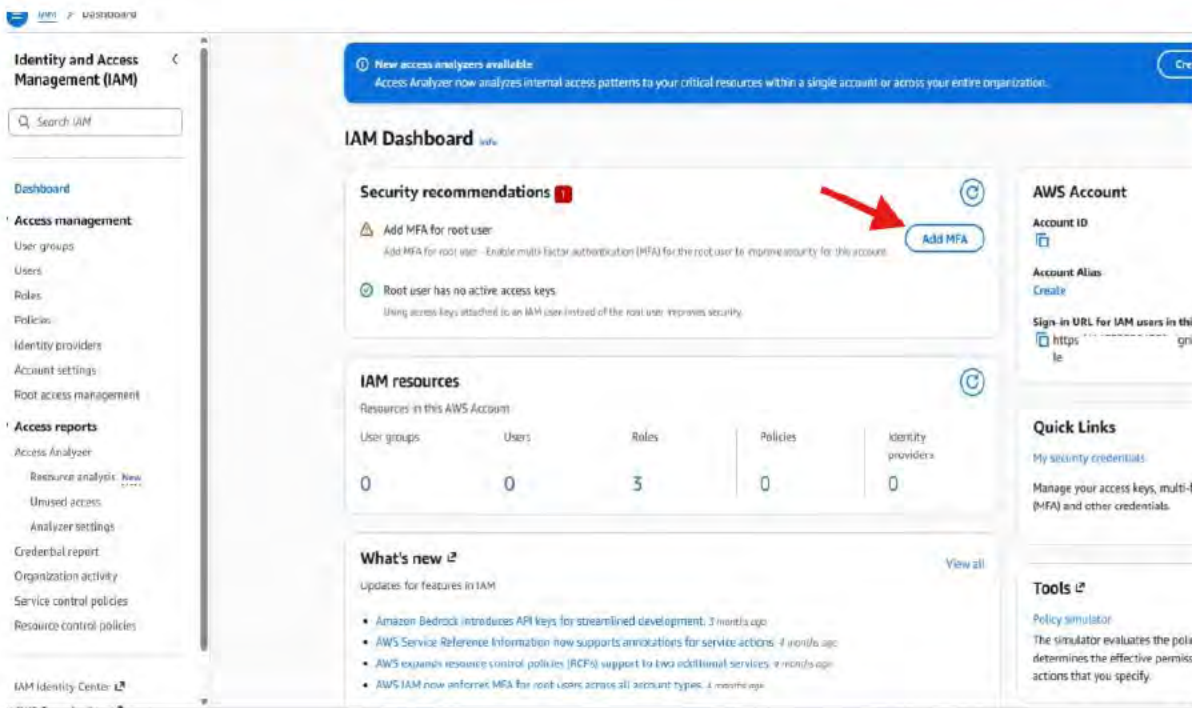


In the search bar, find the IAM service, as best practice, set up MFA



Search for IAM from the search column

click on IAM



Add MFA

Give the device a name and select a MFA device of your choice, in this instance we will use an Authentication app


MFA device name


Device name
This name will be used within the identifying ABH for this device.


Maximum 64 characters. Valid characters: A-Z, a-z, 0-9, and !, ", #, \$, %, &, ' (,), *, +, -, ., /, :; , < , = , > , ? , [, \ ,] , ^ , _ , { , | , } , ~ (space).

MFA device

Device options
In addition to username and password, you will use this device to authenticate into your account.

**Passkey or security key**
Authenticate using your fingerprint, face, or screen lock. Create a passkey on this device or use another device, like a FIDO2 security key.

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

**Hardware TOTP token**
Authenticate using a code generated by Hardware TOTP token or other hardware devices.

[Cancel](#) [Next](#)

Set up device [info](#)

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

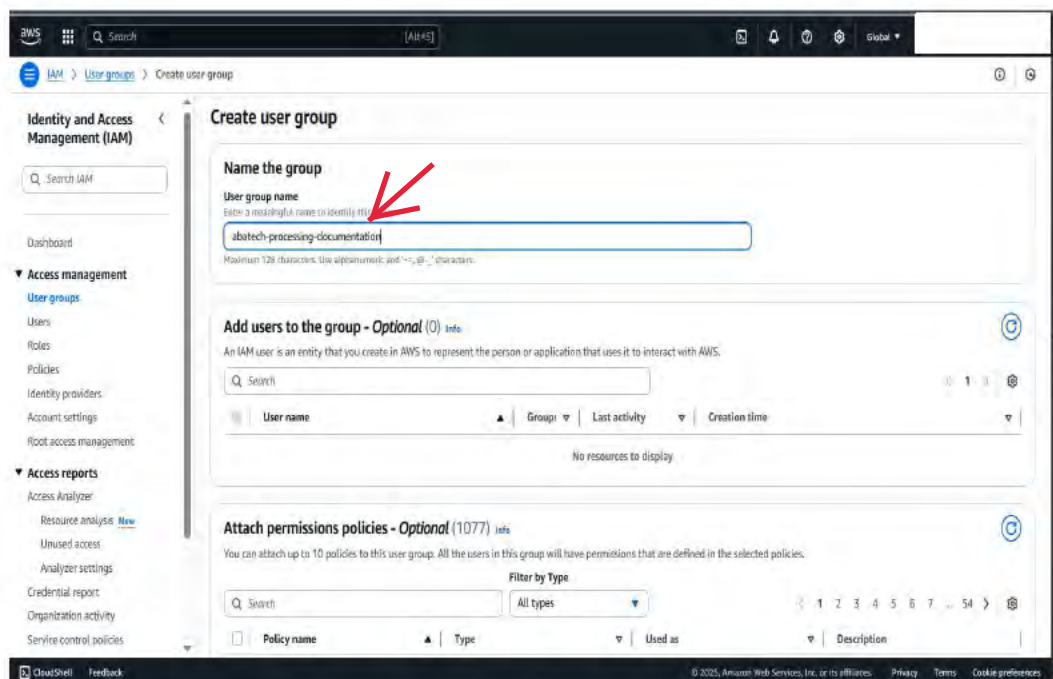
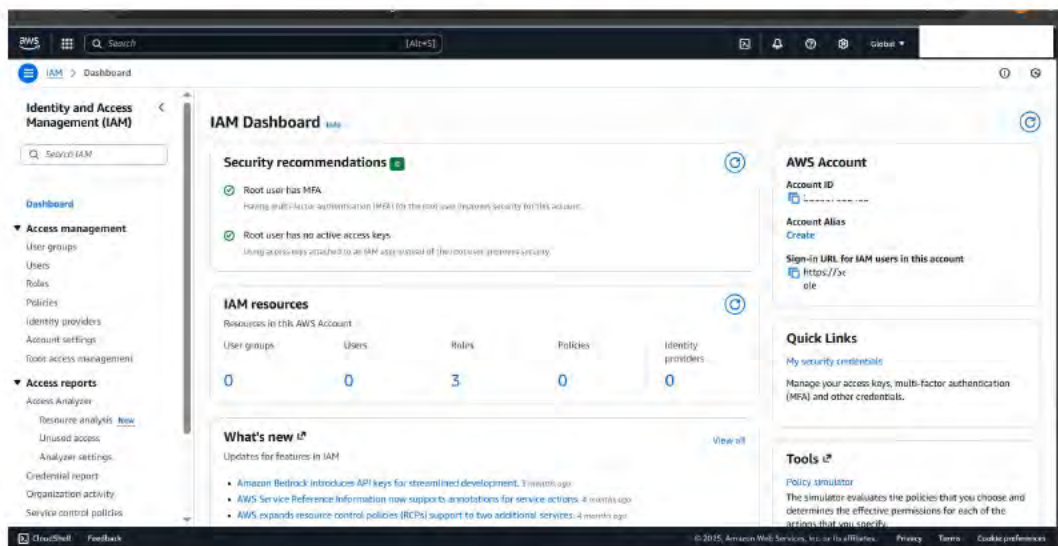
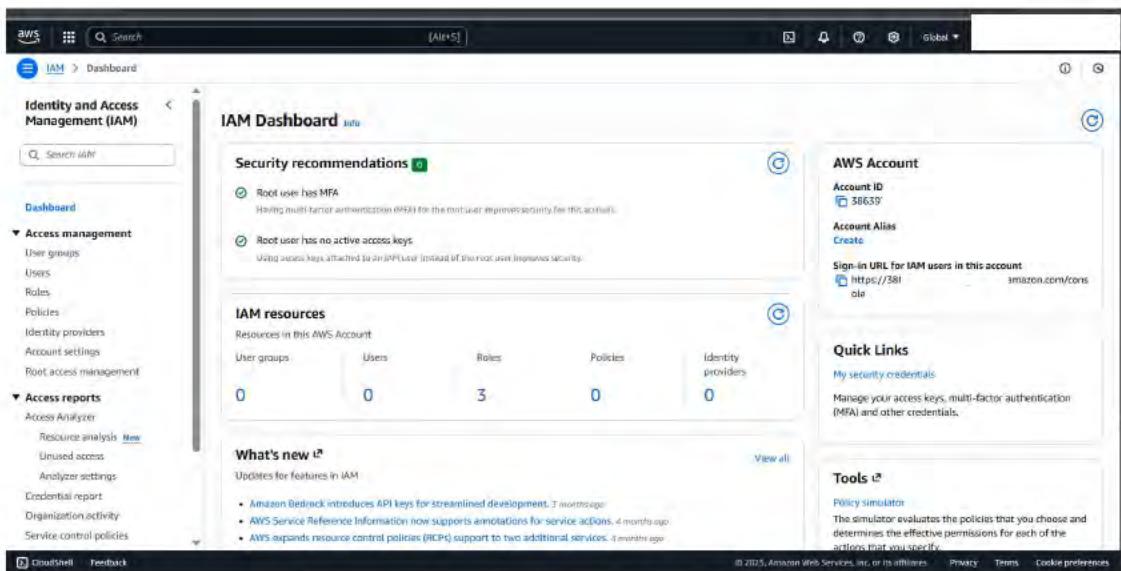

Open your authenticator app, choose [Show QR code](#) on this page, then use the app to scan the code. Alternatively, you can type a [secret key](#).

3

Type two consecutive MFA codes below
Enter a code from your virtual app below

Wait 30 seconds, and enter a second code entry

[Cancel](#) [Previous](#) [Add MFA](#)



Identity and Access Management (IAM)

Search IAM

Dashboard

Access management

- User groups
- Users
- Roles
- Policies
- Identity providers
- Account settings
- Root access management

Access reports

- Access Analyzer
- Resource analysis [New](#)
- Unused access
- Analyzer settings
- Credential report
- Organization activity
- Service control policies

Create user group

Add users to the group - Optional (0) [Info](#)

An IAM user is an entity that you create in AWS to represent the person or application that uses it to interact with AWS.

Search

User name Group: Last activity Creation time

No resources to display

Attach permissions policies - Optional (1/1077) [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.

Search Filter by Type All types

Policy name	Type	Used as	Description
<input checked="" type="checkbox"/> AdministratorAccess	AWS managed - job function	None	Provides full access to AWS services an...
<input type="checkbox"/> AdministratorAccess-Amplicity	AWS managed	None	Grants account administrative permissi...
<input type="checkbox"/> AdministratorAccess-AWSE...	AWS managed	None	Grants account administrative permissi...
<input type="checkbox"/> AIOpsAssistantIncidentRep...	AWS managed	None	Provides permissions required by the A...
<input type="checkbox"/> AIOpsAssistantPolicy	AWS managed	None	Provides ReadOnly permissions requir...

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Create user group

Policy name	Type	Used as	Description
<input type="checkbox"/> AWSOpsOnboardingPolicy	AWS managed	None	Grants full access to Amazon AI Opera...
<input type="checkbox"/> AIOpsOperatorAccess	AWS managed	None	Grants access to the Amazon AI Opera...
<input type="checkbox"/> AIOpsReadOnlyAccess	AWS managed	None	Grants ReadOnly permissions to the A...
<input type="checkbox"/> AlexaForBusinessDeviceSet...	AWS managed	None	Provide device setup access to AlexaFo...
<input type="checkbox"/> AlexaForBusinessFullAccess	AWS managed	None	Grants full access to AlexaForBusiness ...
<input type="checkbox"/> AlexaForBusinessGatewayE...	AWS managed	None	Provide gateway execution access to A...
<input type="checkbox"/> AlexaForBusinessLifeseizeDe...	AWS managed	None	Provide access to Lifeseize AWS devices
<input type="checkbox"/> AlexaForBusinessPolyDeleg...	AWS managed	None	Provide access to Poly AWS devices
<input type="checkbox"/> AlexaForBusinessReadOnly...	AWS managed	None	Provide read only access to AlexaForBu...
<input type="checkbox"/> AmazonAPIGatewayAdmini...	AWS managed	None	Provides full access to create/edit/dele...
<input type="checkbox"/> AmazonAPIGatewayInvoke...	AWS managed	None	Provides full access to invoke APIs in A...
<input type="checkbox"/> AmazonAPIGatewayPushT...	AWS managed	None	Allows API Gateway to push logs to us...
<input type="checkbox"/> AmazonAppFlowFullAccess	AWS managed	None	Provides full access to Amazon AppFlo...
<input type="checkbox"/> AmazonAppFlowReadOnly...	AWS managed	None	Provides read only access to Amazon A...
<input type="checkbox"/> AmazonAppStreamFullAcc...	AWS managed	None	Provides full access to Amazon AppStr...

[Cancel](#) [Create user group](#)

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Identity and Access Management (IAM)

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- Organization activity
- Service control policies

User groups (1) [Info](#)

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

Search

Group name	Users	Permissions	Creation time
<input checked="" type="checkbox"/> abatech-processing-documentation		0 Defined	Now

[View group](#) [Delete](#) [Create group](#)

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aws

Search

[Alt+S]

IAM

Users

Create user

Step 1

Specify user details

Step 2

Set permissions

Step 3

Review and create

Step 4

Retrieve password

Specify user details

User details

User name

abatech-processing-documentation-jude

The user name can have up to 64 characters. Valid characters: A-Z, a-z, 0-9, and +, -, @, _ (hyphen).

☒ Provide user access to the AWS Management Console - optional

If you're providing console access to a person, it's a best practice to manage their access in IAM Identity Center.

Console password

☐ Autogenerated password

You can view the password after you create the user.

☒ Custom password

Enter a custom password for the user.

- Must be at least 8 characters long
- Must include at least three of the following mix of character types: uppercase letters (A-Z), lowercase letters (a-z), numbers (0-9), and symbols (@ # \$ % ^ & * () _ = - [\] ' ")

☐ Show password

☒ Users must create a new password at next sign-in - Recommended

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

1

If you are creating programmatic access through access keys or service-specific credentials for AWS CodeCommit or Amazon Keyspaces, you can generate them after you create this IAM user. [Learn more](#)

CloudShell

Feedback

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aws

Search

[Alt+S]

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aws

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abatech-processing-documentation-jude

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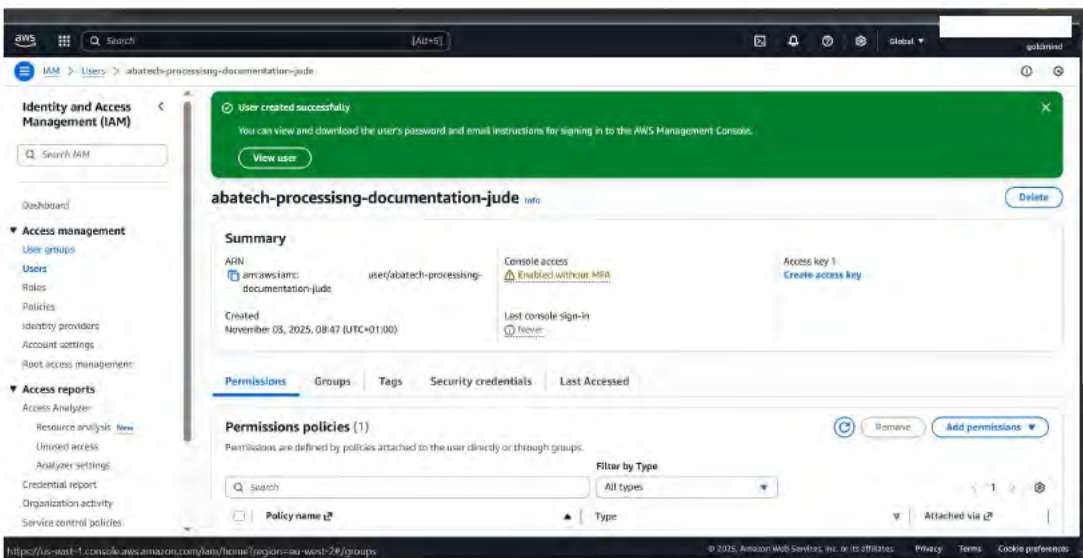
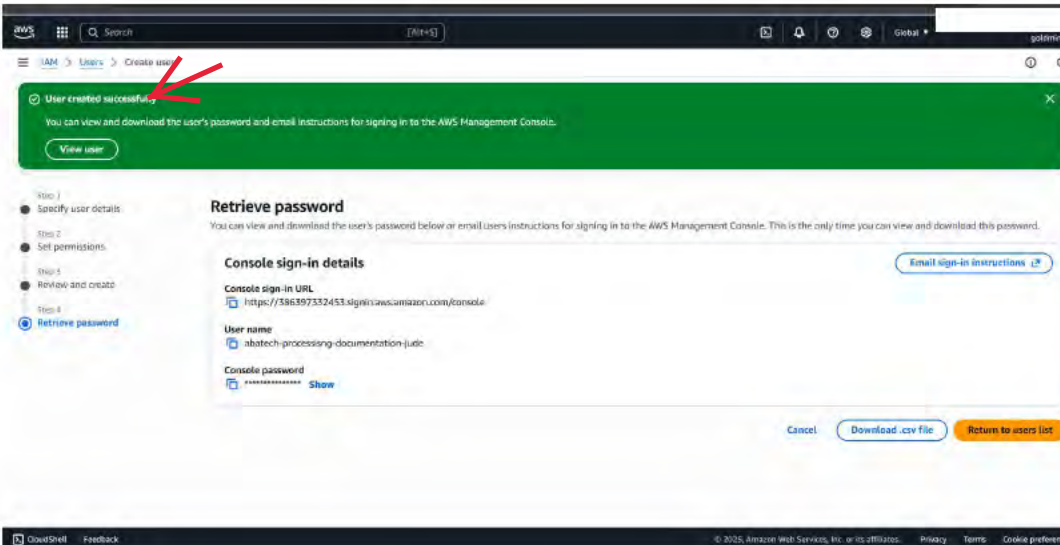
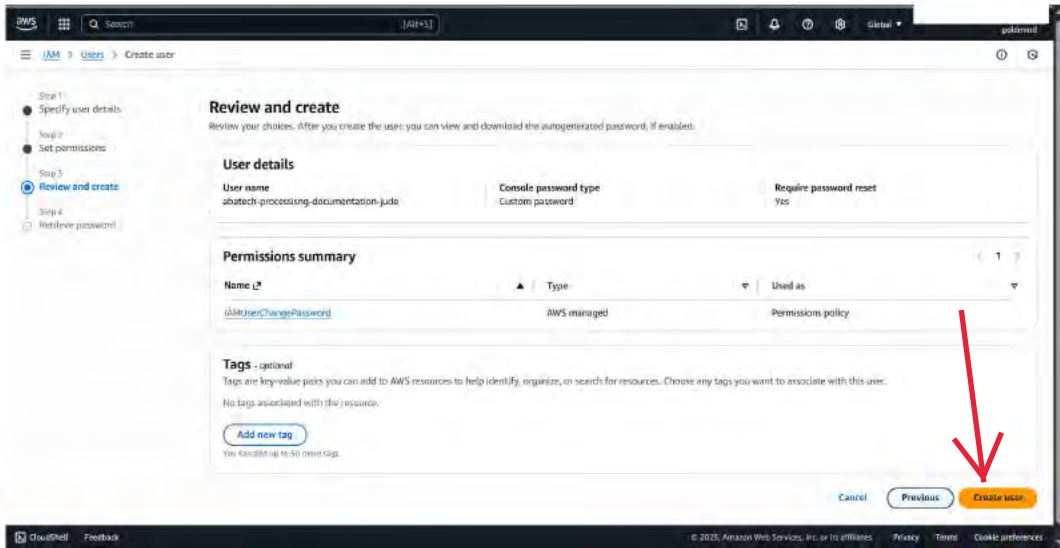
Cancel

Next

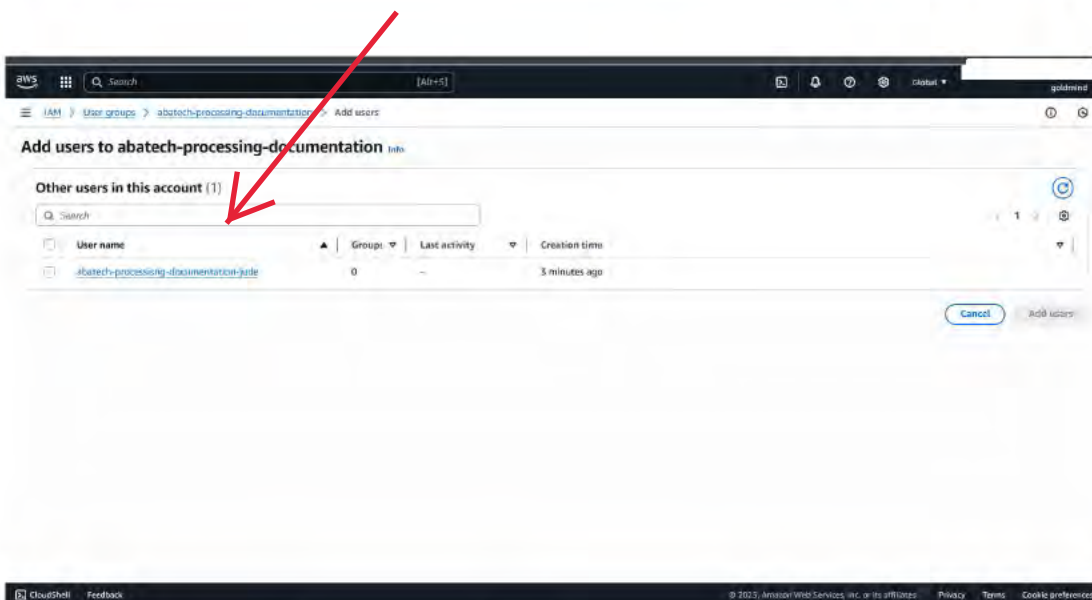
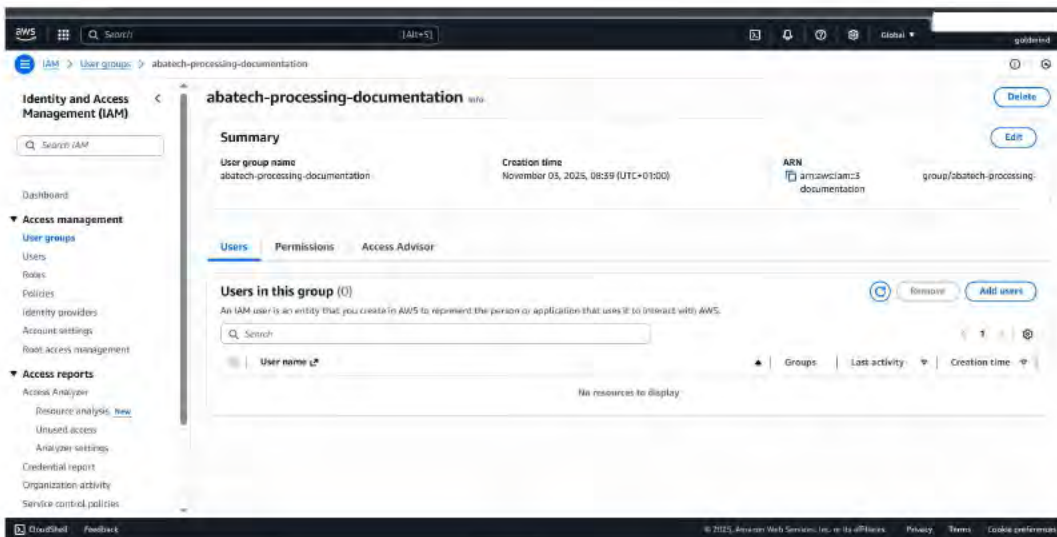
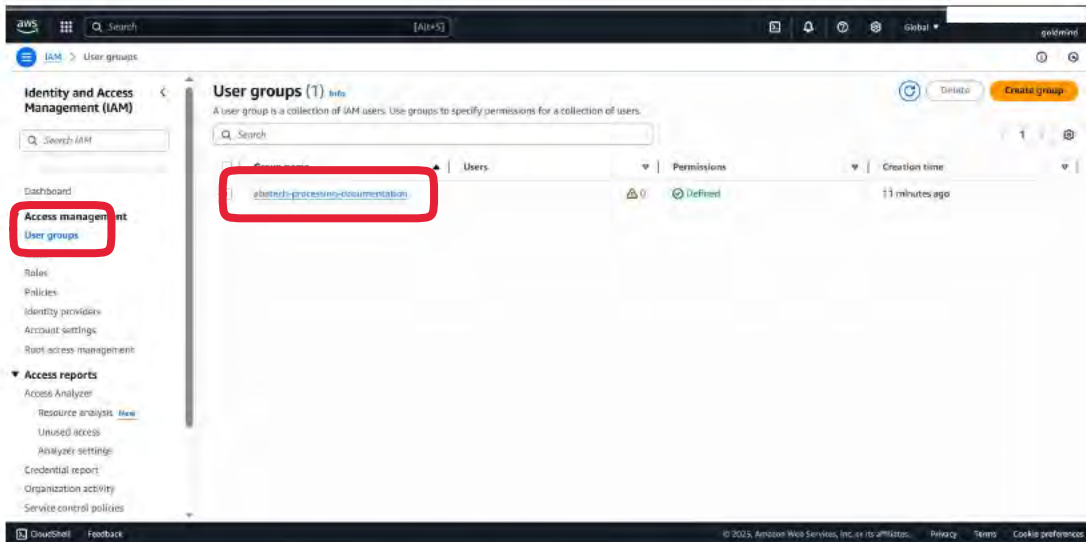
CloudShell

Feedback

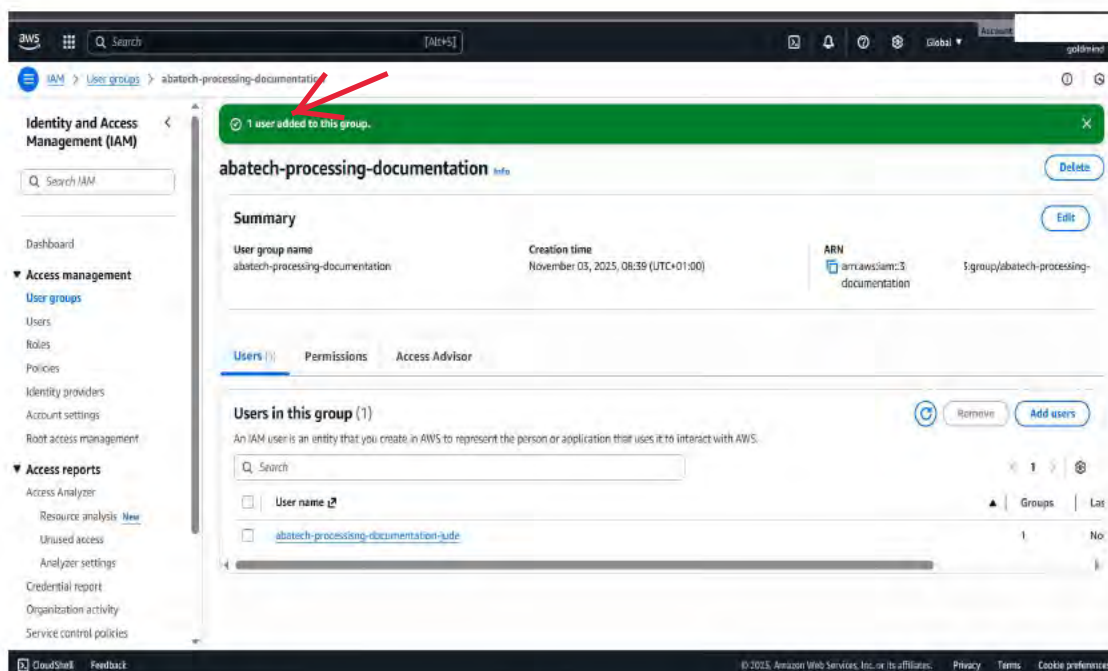
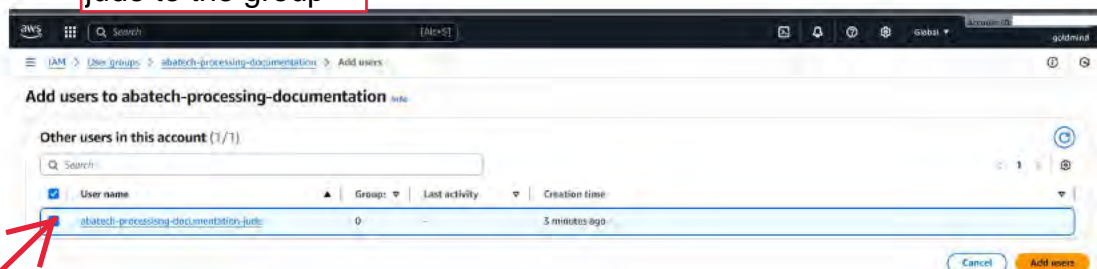
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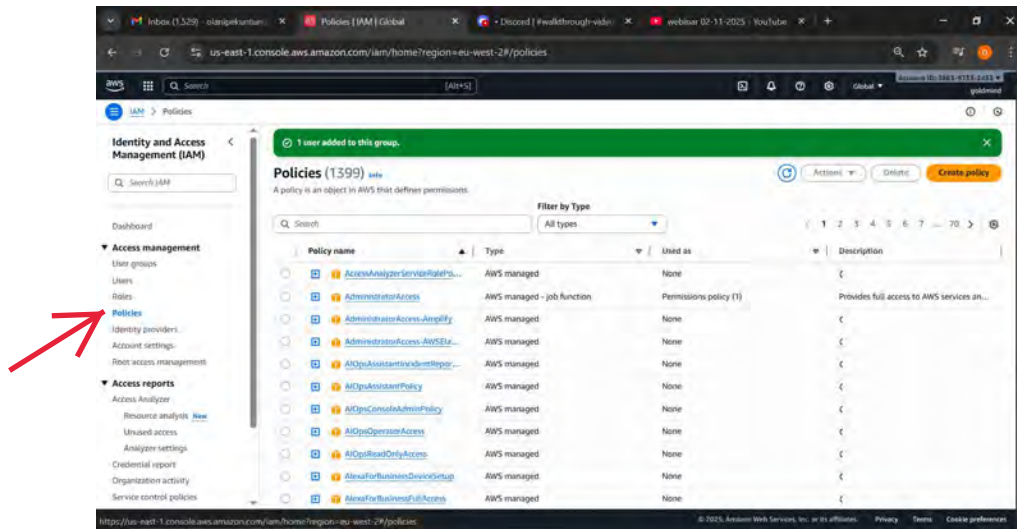
ADDING THE USER TO A GROUP



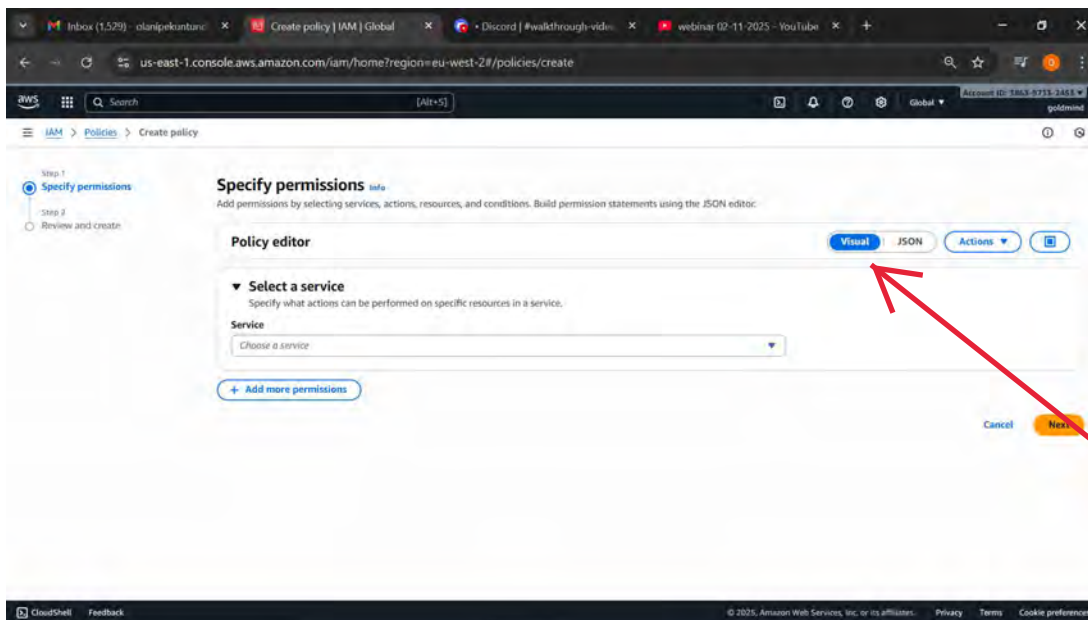
ADD abatech
processing-
documentation -
jude to the group



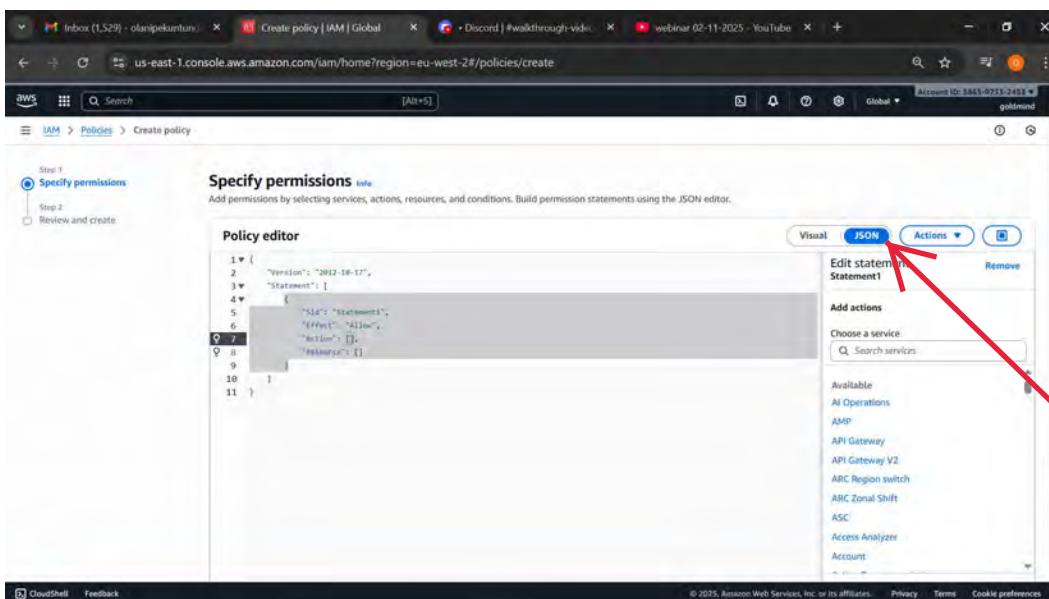
CREATING POLICIES



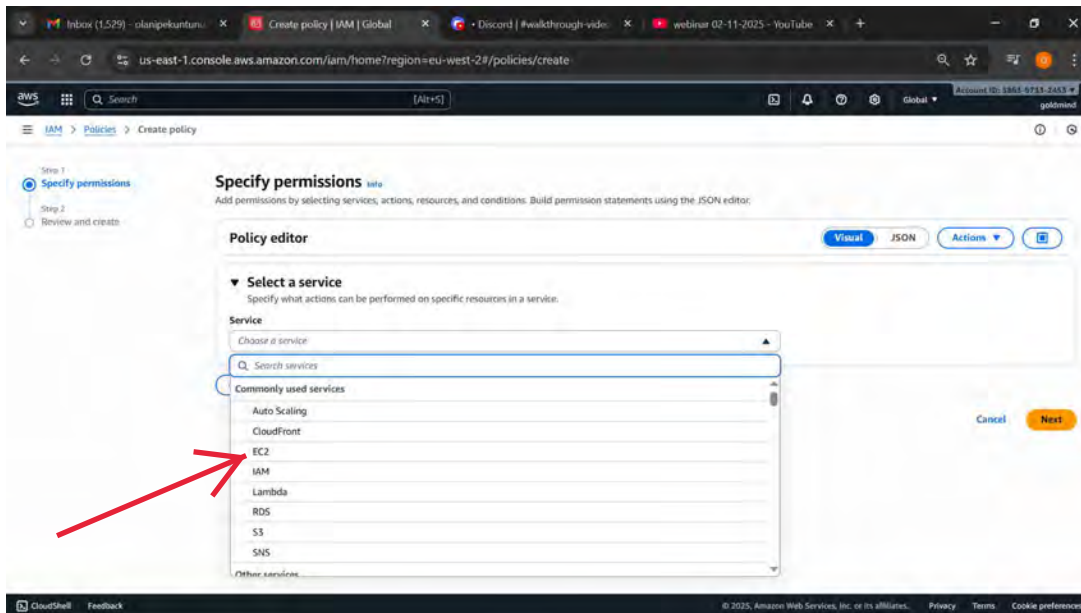
Click on policies



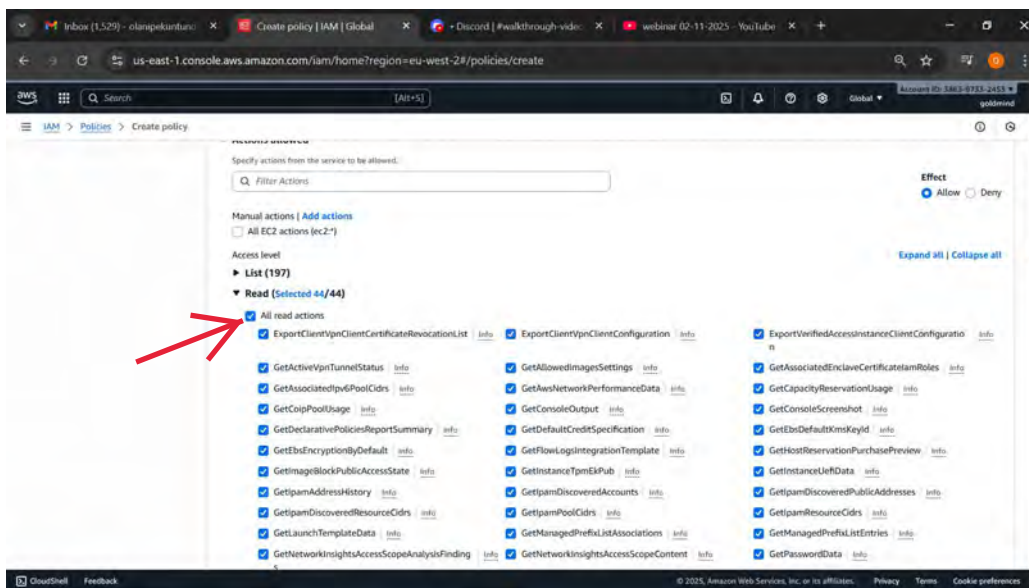
this is the visual icon if you want to click through or choose a policy



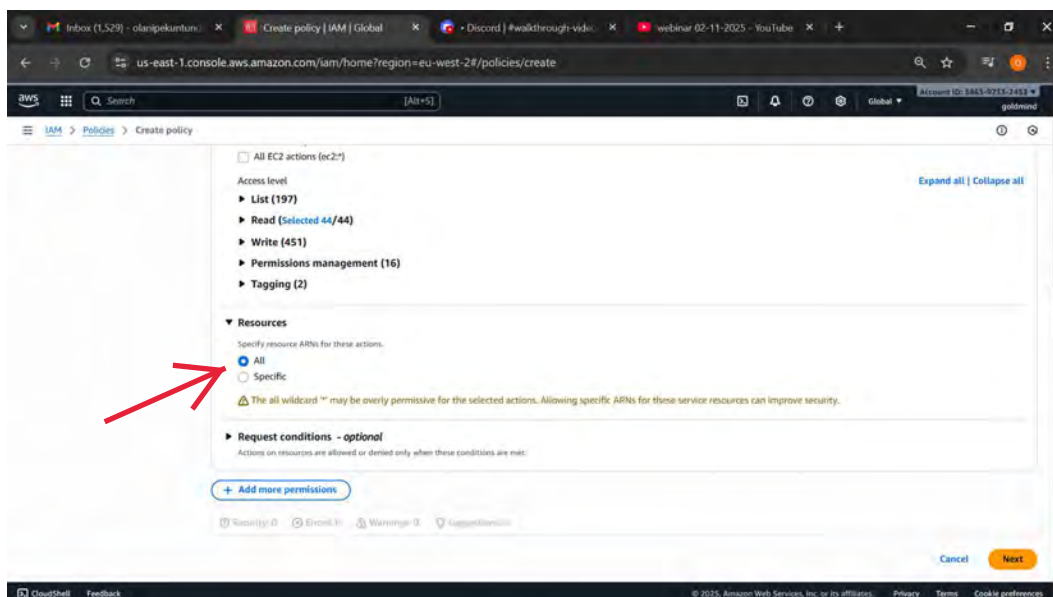
if you want to add a json script you can click the json portion and add the script



Then select the service from the drop down you wish to add a policy - in this case 'EC2'



add the policies



us-east-1.console.aws.amazon.com/iam/home?region=eu-west-2#/policies/create

Step 1: Specify permissions
Step 2: Review and create

Review and create

Review the permissions, specify details, and tags.

Policy details

Policy name
Enter a meaningful name to identify this policy.

Access
Maximum 128 characters. Use alphanumeric and "+, -, @, _" characters.

Description - optional
Add a short explanation for this policy.

who has access to the documents

Maximum 1,000 characters. Use alphanumeric and "+, -, @, _" characters.

Permissions defined in this policy

Permissions defined in this policy document specify which actions are allowed or denied. To define permissions for an IAM identity (user, user group, or role), attach a policy to it.

Search

Allow (1 of 450 services)

Service: EC2 | Access level: Full: Read | Resource: All resources | Request condition: None

Show remaining 449 services

give your policy a name and description

us-east-1.console.aws.amazon.com/iam/home?region=eu-west-2#/policies/create

who has access to the documents

Maximum 1,000 characters. Use alphanumeric and "+, -, @, _" characters.

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Search

Allow (1 of 450 services)

Service: EC2 | Access level: Full: Read | Resource: All resources | Request condition: None

Show remaining 449 services

Add tags - optional

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 new tag

You can add up to 50 more tags.

Cancel Previous **Create policy**

click create policy

us-east-1.console.aws.amazon.com/iam/home?region=eu-west-2#/policies

Identity and Access Management (IAM)

Policy Access created.

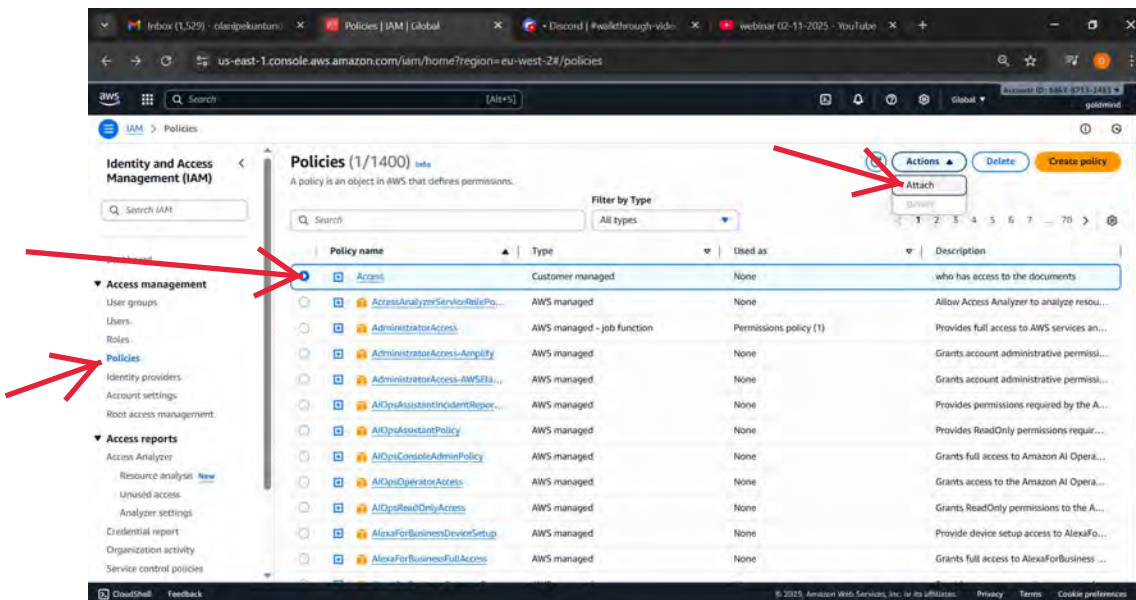
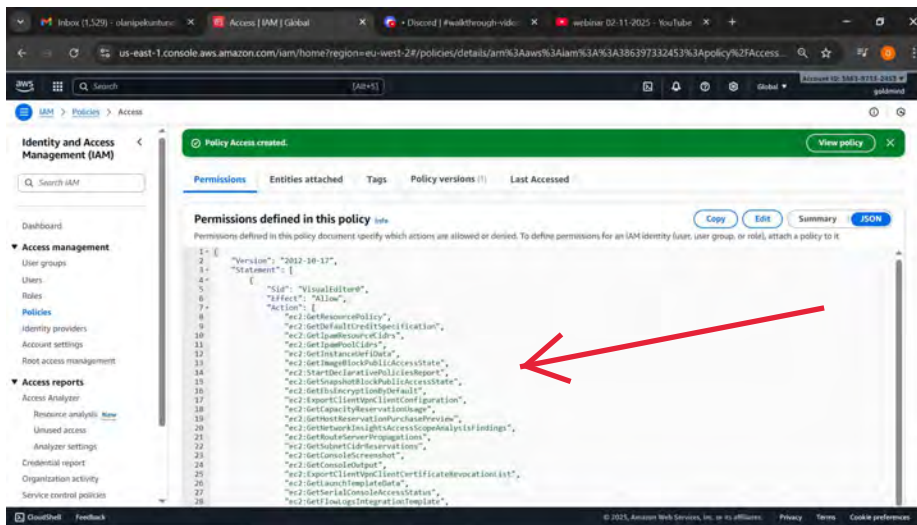
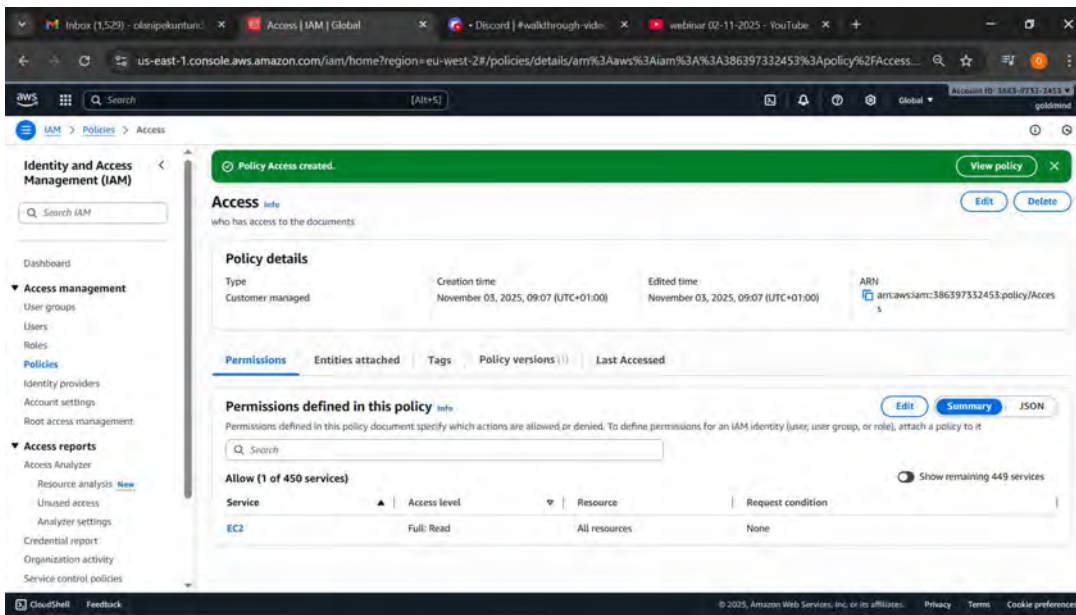
Policies (1400)

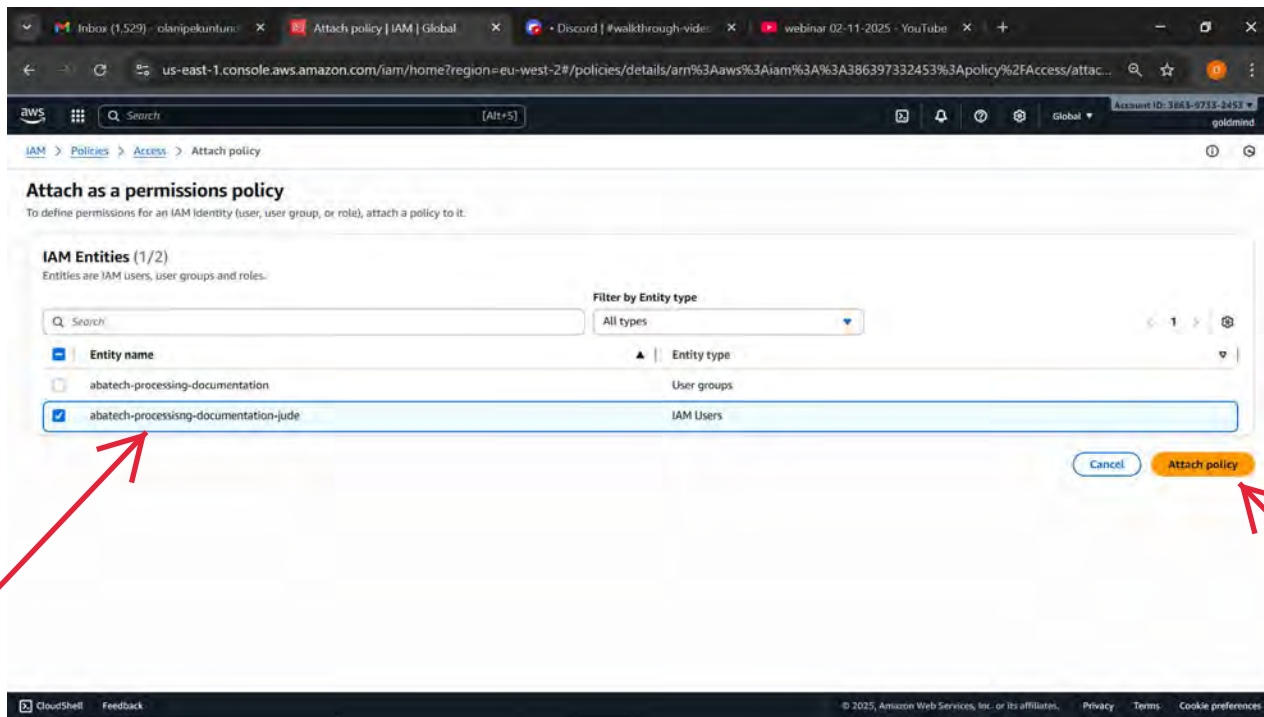
A policy is an object in AWS that defines permissions.

Filter by Type: All types

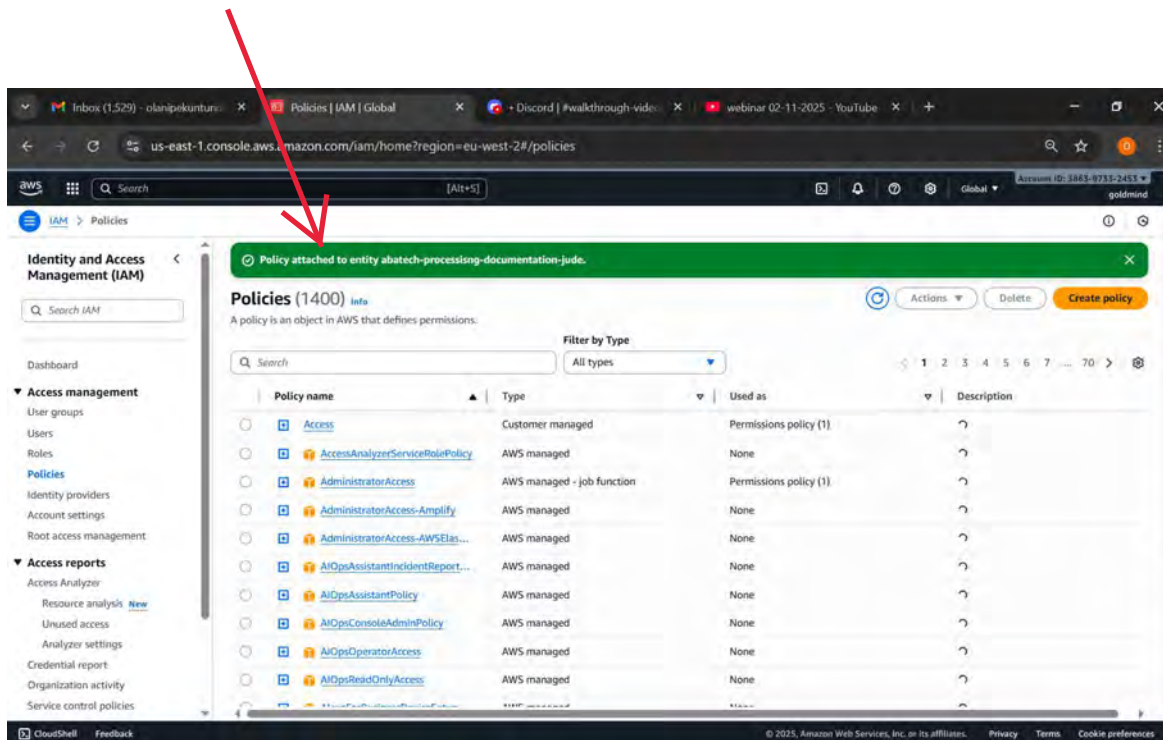
Policy name	Type	Used as	Description
Access	Customer managed	None	who has access to the documents
AccessAnalyzerServiceRolePolicy	AWS managed	None	Allow Access Analyzer to analyze resou...
AdministratorAccess	AWS managed - job function	Permissions policy (1)	Provides full access to AWS services an...
AdministratorAccess-Amplify	AWS managed	None	Grants account administrative permisi...
AdministratorAccess-AWSElas...	AWS managed	None	Grants account administrative permisi...
AIOpsAssistantIncidentReport...	AWS managed	None	Provides permissions required by the A...
AIOpsAssistantPolicy	AWS managed	None	Provides ReadOnly permissions requir...
AIOpsConsoleAdminPolicy	AWS managed	None	Grants full access to Amazon AI Opera...
AIOpsOperatorAccess	AWS managed	None	Grants access to the Amazon AI Opera...
AIOpsReadOnlyAccess	AWS managed	None	Grants ReadOnly permissions to the A...

policy now created

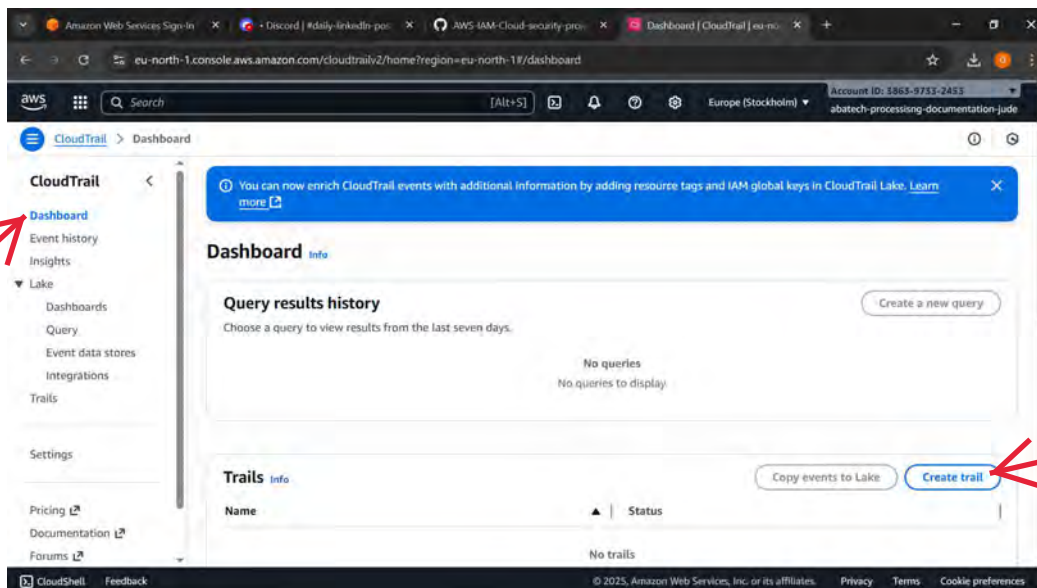
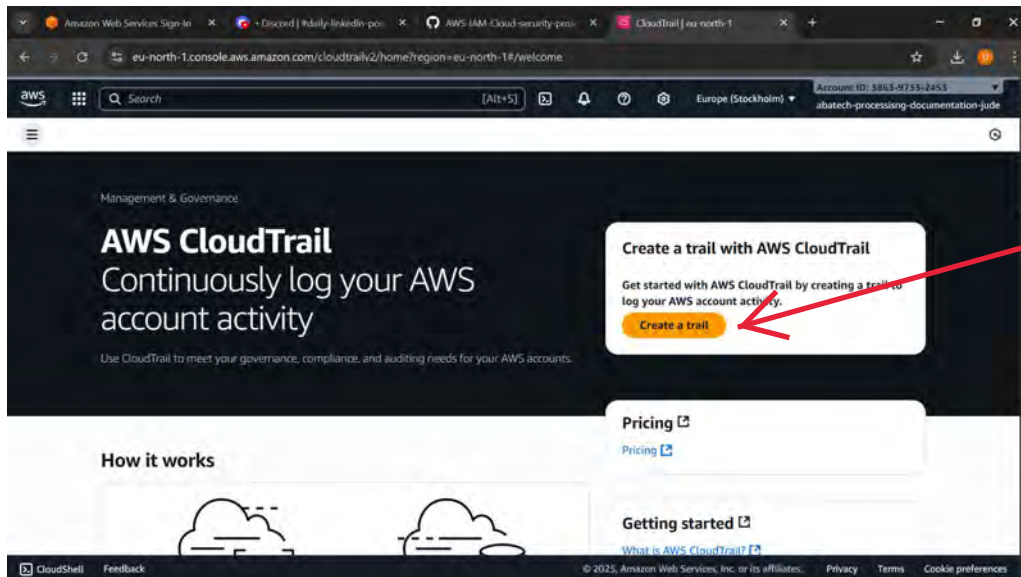
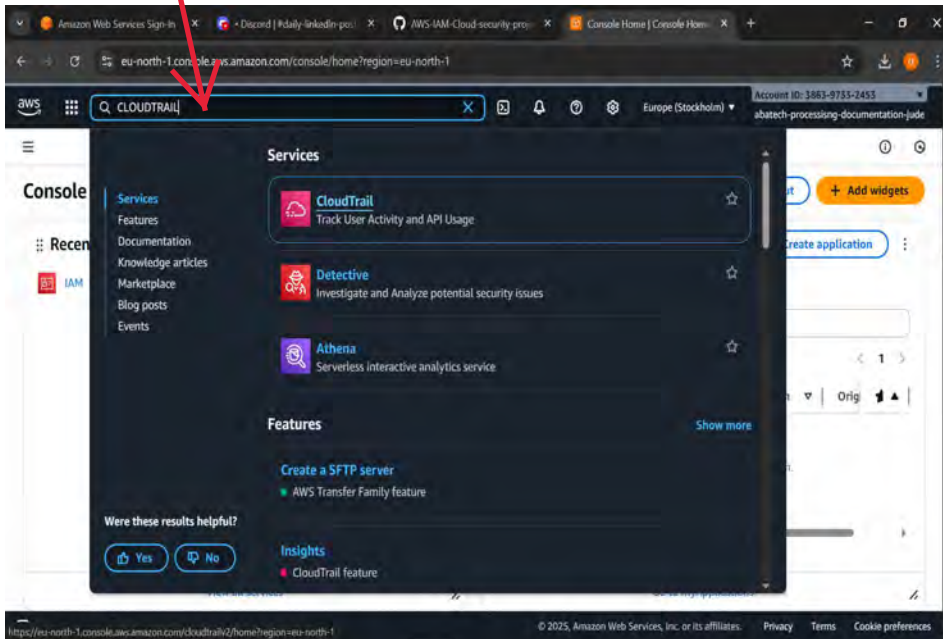




now select either a user or a group as you wish ... in this case i am selecting a user



policy now attached to this user



Amazon Web Services Sign-In | Discord | #daily-linkedin-post | AWS IAM Cloud security proj | Create trail | CloudTrail | eu-north-1 | create

eu-north-1.console.aws.amazon.com/cloudtrailv2/home?region=eu-north-1#/create

CloudTrail > Dashboard > Create trail

Step 1: Choose trail attributes

Choose trail attributes

General details
A trail created in the console is a multi-region trail. [Learn more](#)

Trial name
Enter a display name for your trail.

3-128 characters. Only letters, numbers, periods, underscores, and dashes are allowed.

Storage location
☒ Create new S3 bucket
Create a bucket to store logs for this trail.
☐ Use existing S3 bucket
Choose an existing bucket to store logs for this trail.

Trial log bucket and folder
Enter a new S3 bucket name and folder (optional) to store your logs. Bucket names must be globally unique.

Logs will be stored in aws-cloudtrail-logs-386397332453-bb3e207c/AWSLogs/386397332453

Log file SSE-KMS encryption
☒ Enabled

Customer managed AWS KMS key
☒ New
☐ Existing

Amazon Web Services Sign-In | Discord | #daily-linkedin-post | AWS IAM Cloud security proj | Create trail | CloudTrail | eu-north-1 | create

eu-north-1.console.aws.amazon.com/cloudtrailv2/home?region=eu-north-1#/create

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eu-north-1.console.aws.amazon.com/cloudtrailv2/home?region=eu-north-1#/create

CloudTrail > Dashboard > Create trail

AWS KMS alias

KMS key and S3 bucket must be in the same region.

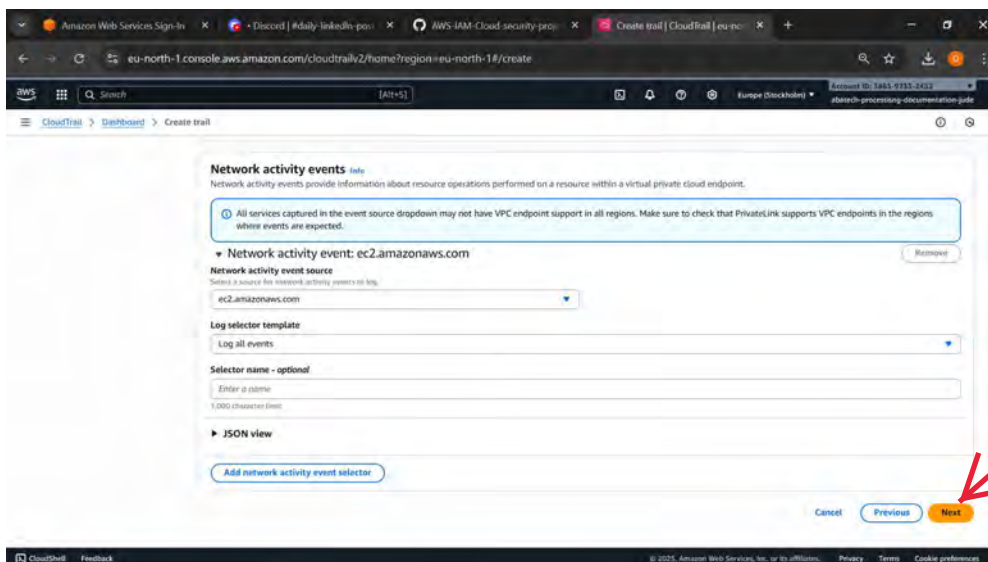
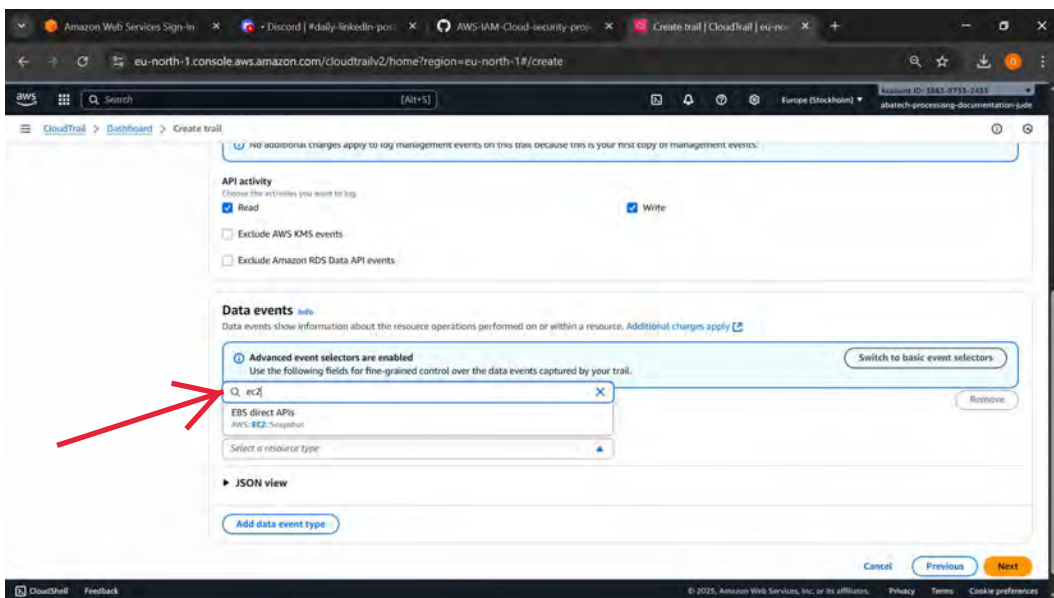
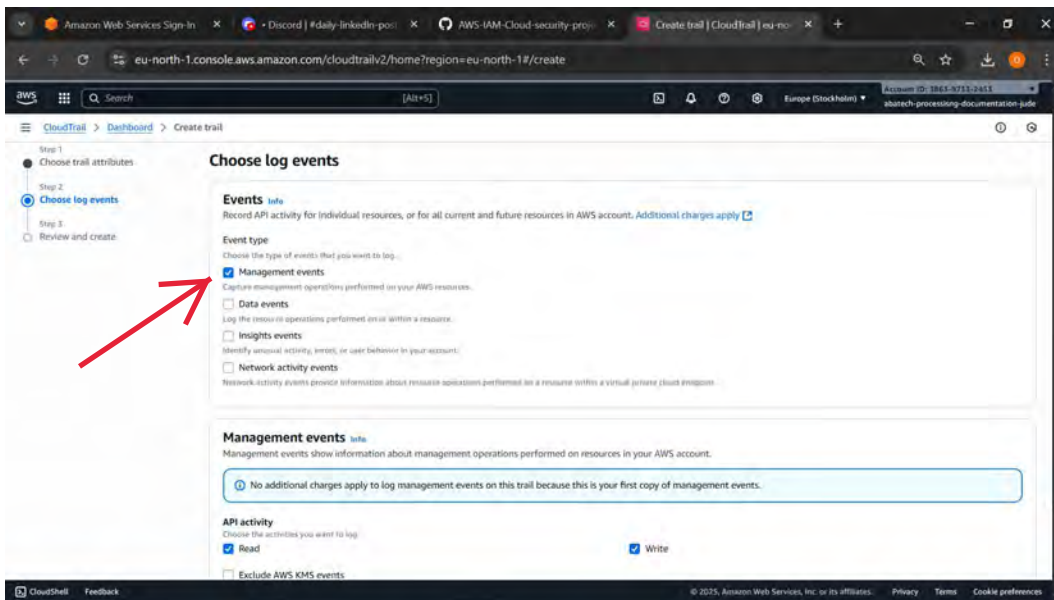
Additional settings
Log file validation
☒ Enabled
SNS notification delivery
☐ Enabled

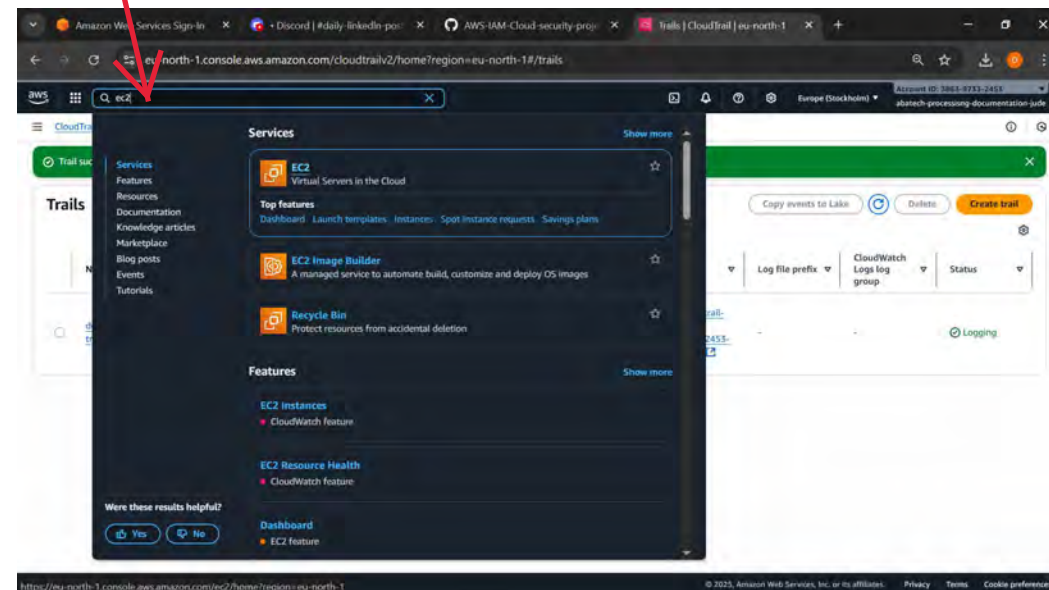
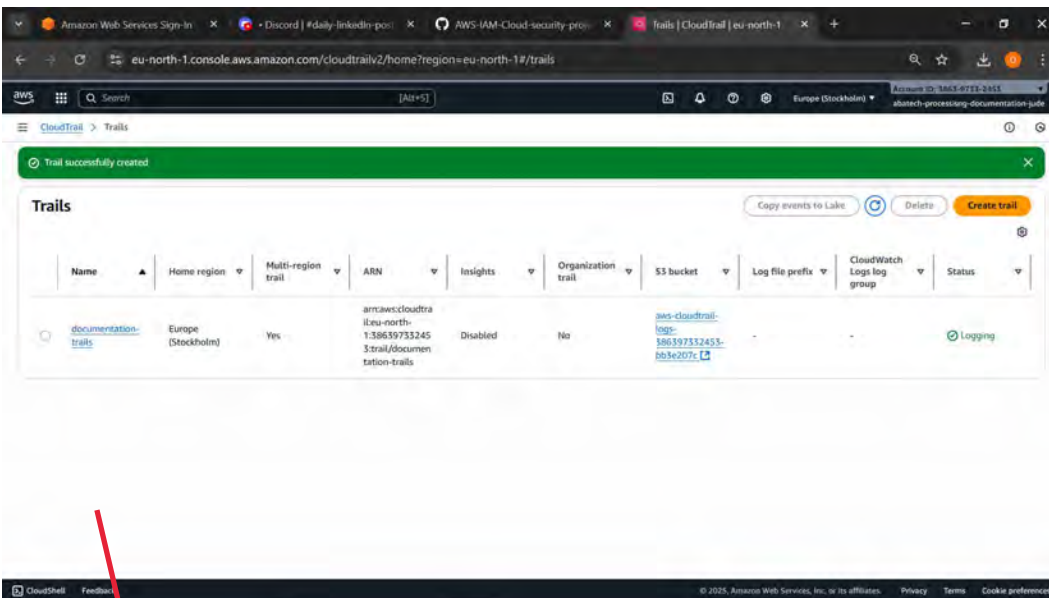
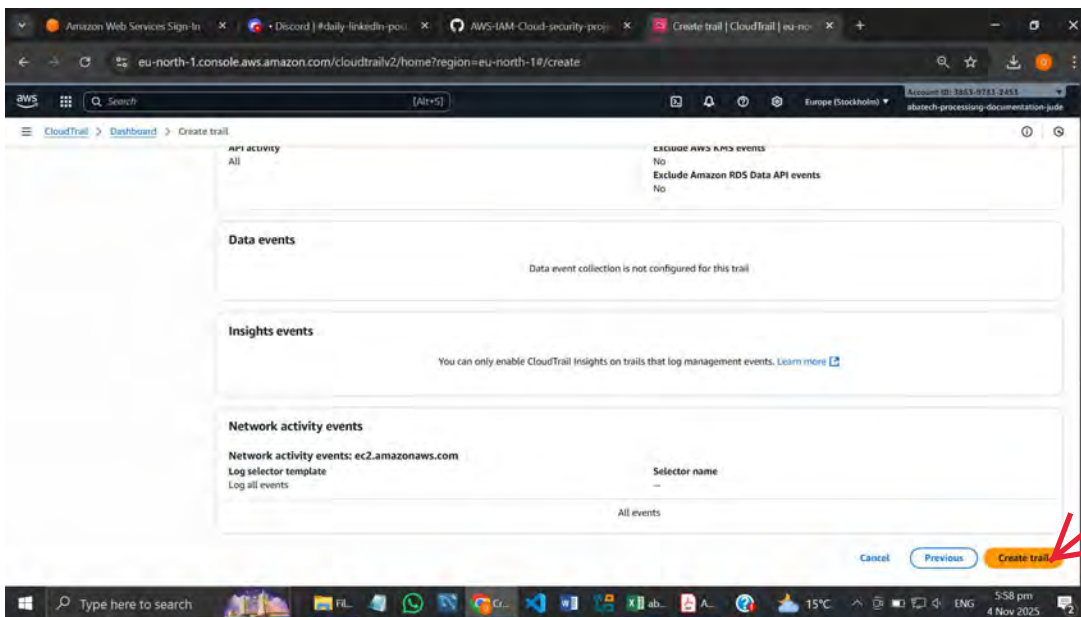
CloudWatch Logs - optional
Configure CloudWatch Logs to monitor your trail logs and notify you when specific activity occurs. Standard CloudWatch and CloudWatch Logs charges apply. [Learn more](#)
CloudWatch Logs
☐ Enabled

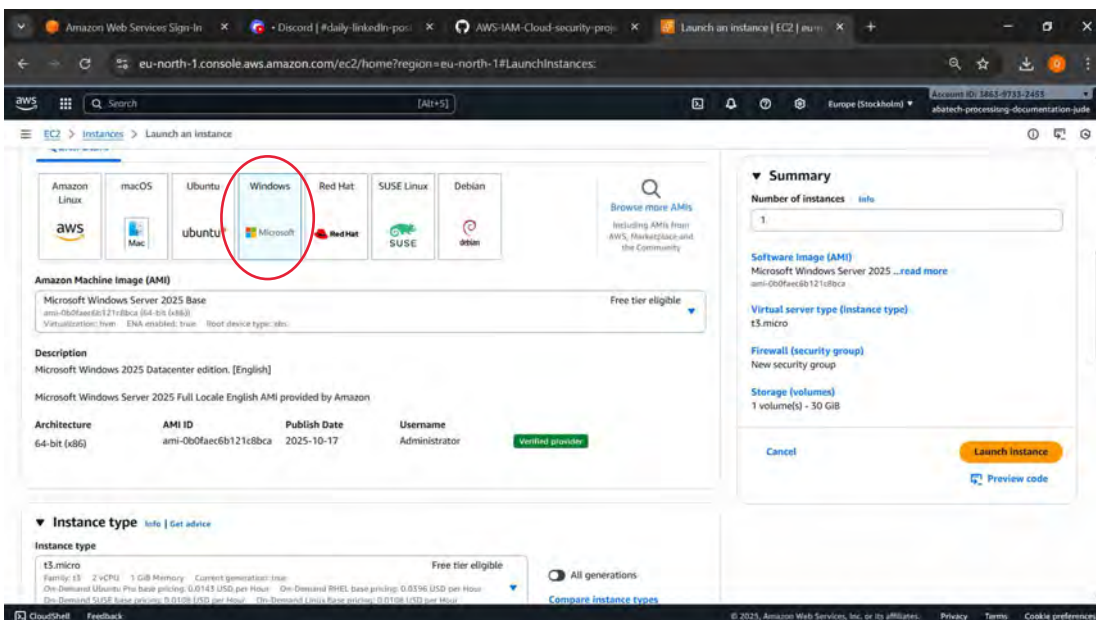
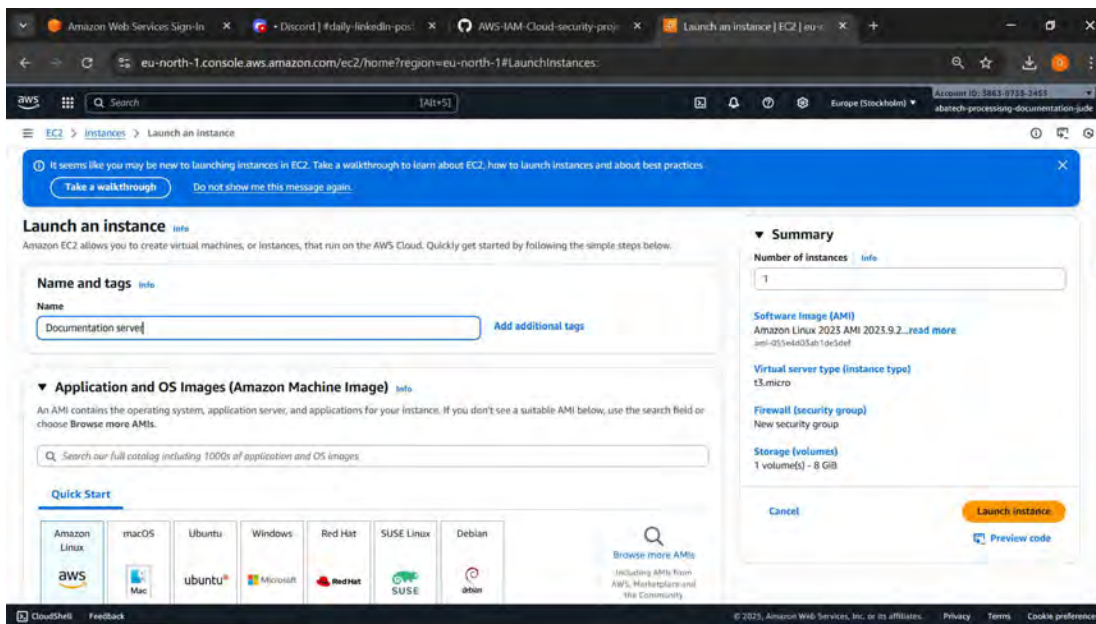
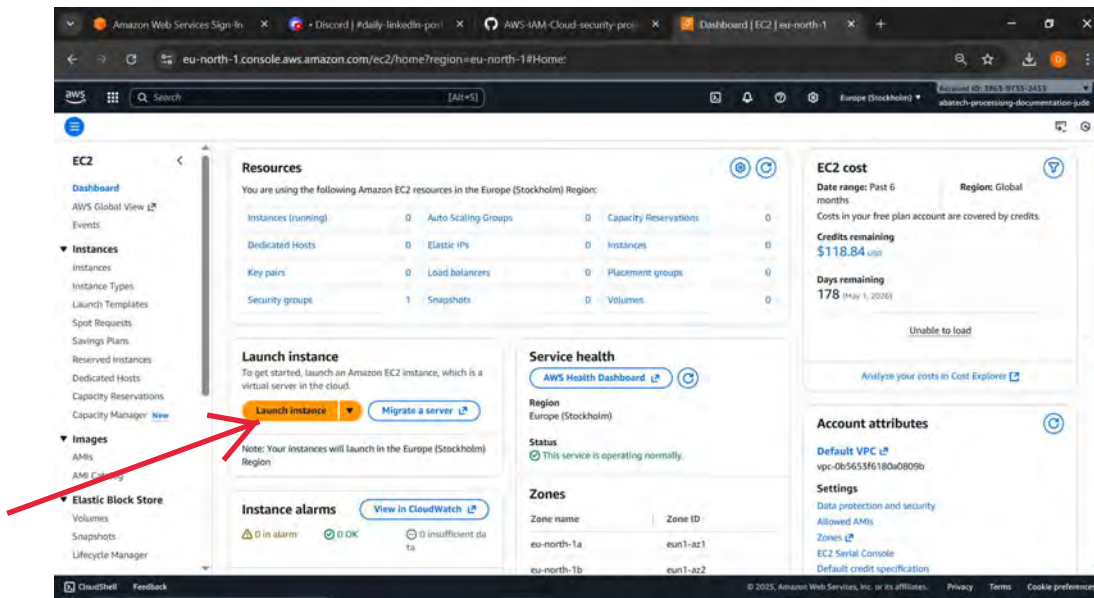
Policy document

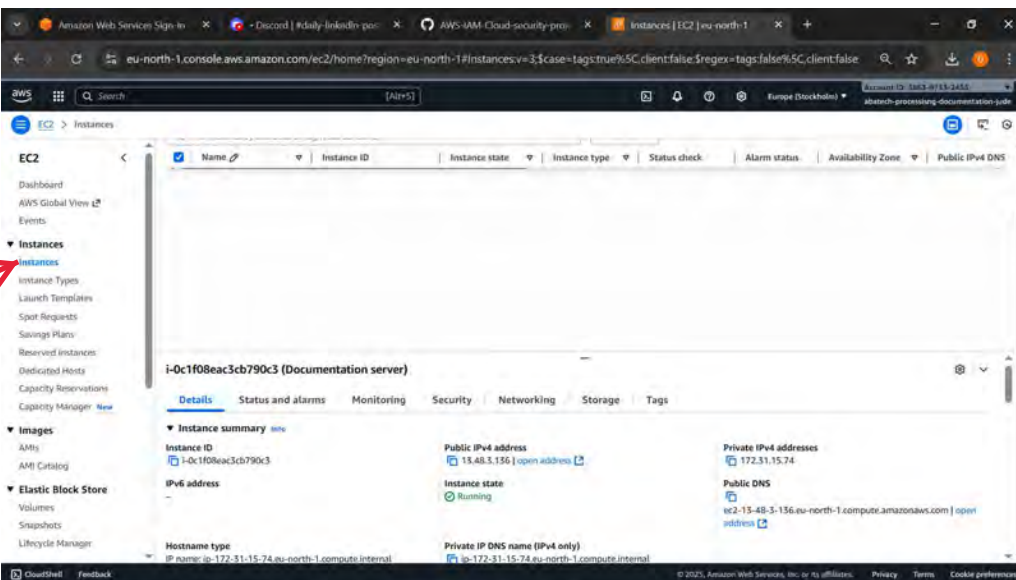
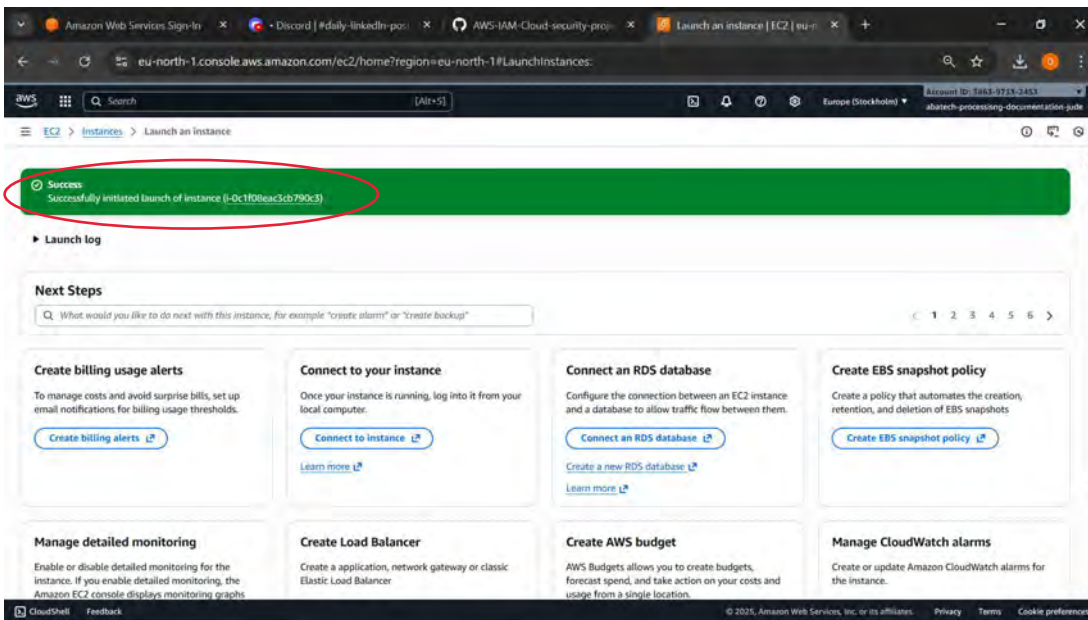
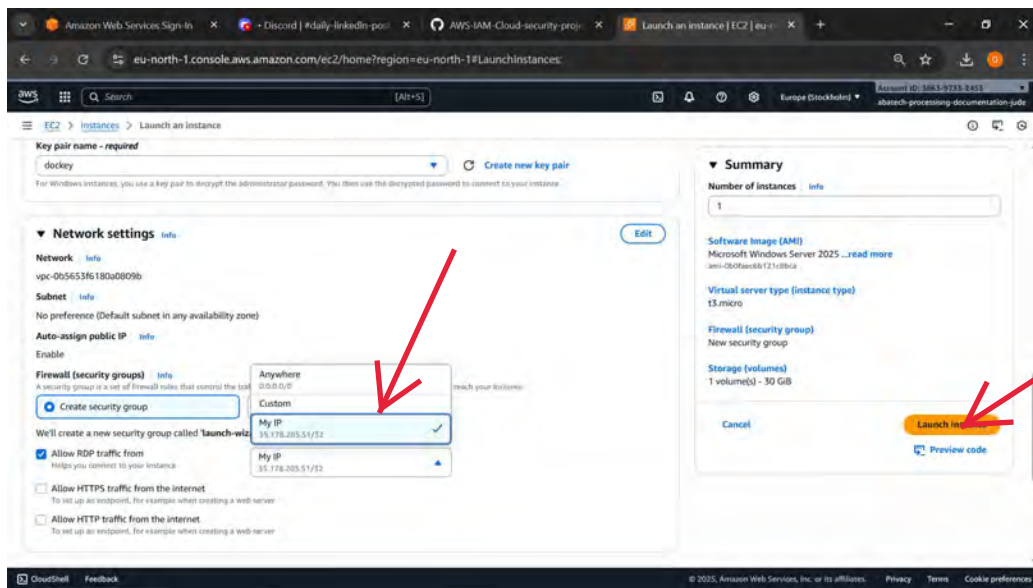
Tags - optional
You can add one or more tags to help you manage and organize your resources, including trails.

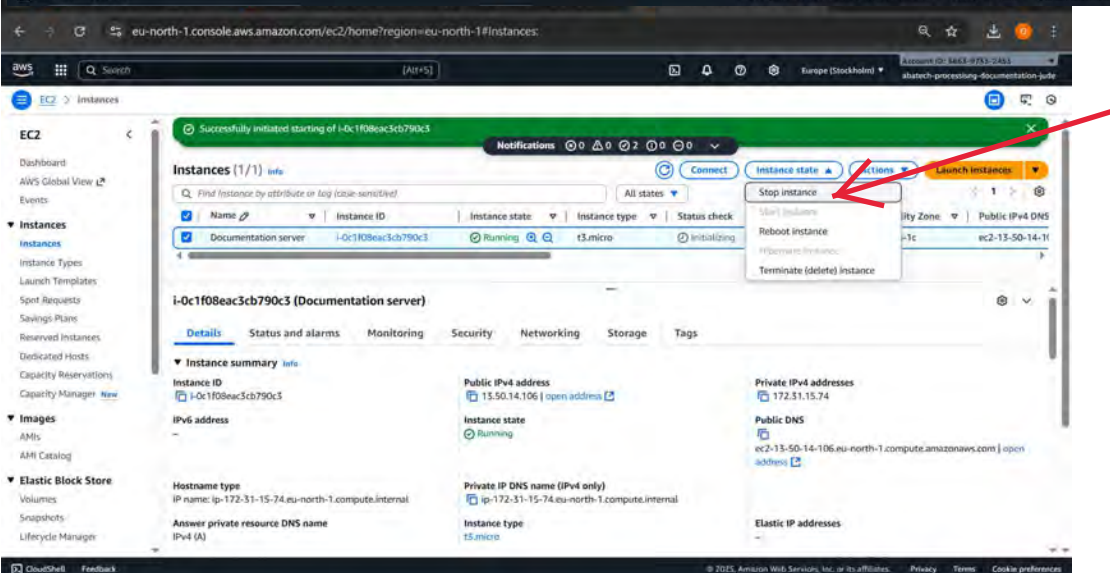
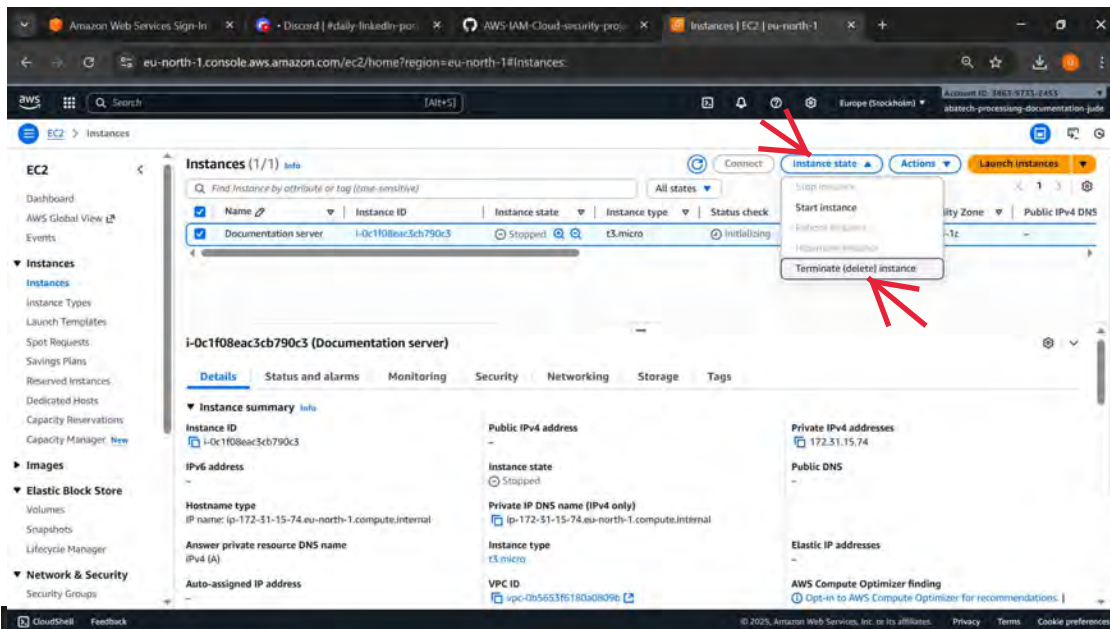
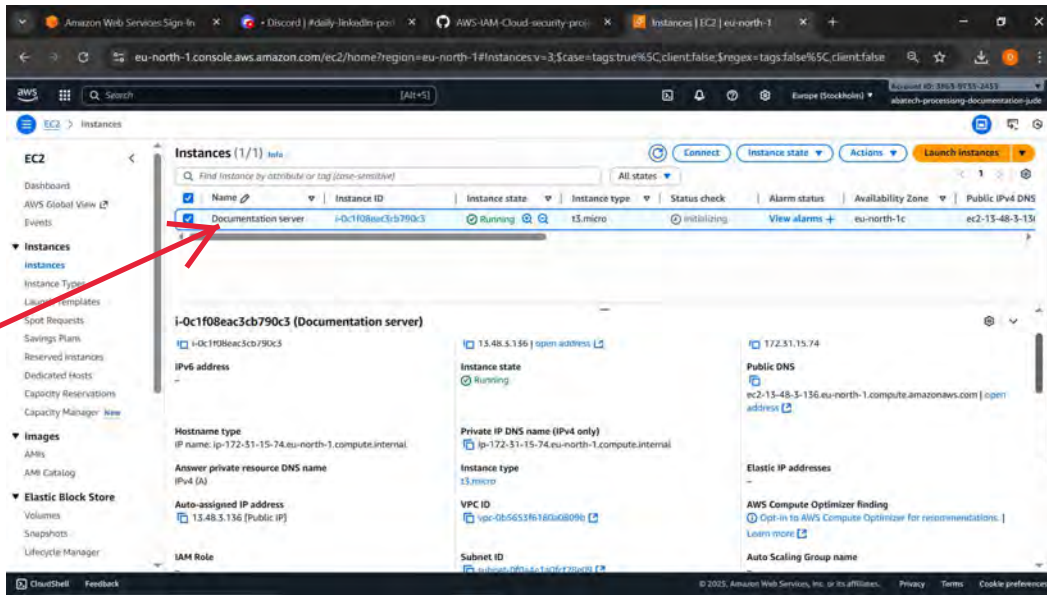
Key	Value - optional	
<input type="text" value="Enter key"/>	<input type="text" value="Enter value"/>	<button>Remove</button>

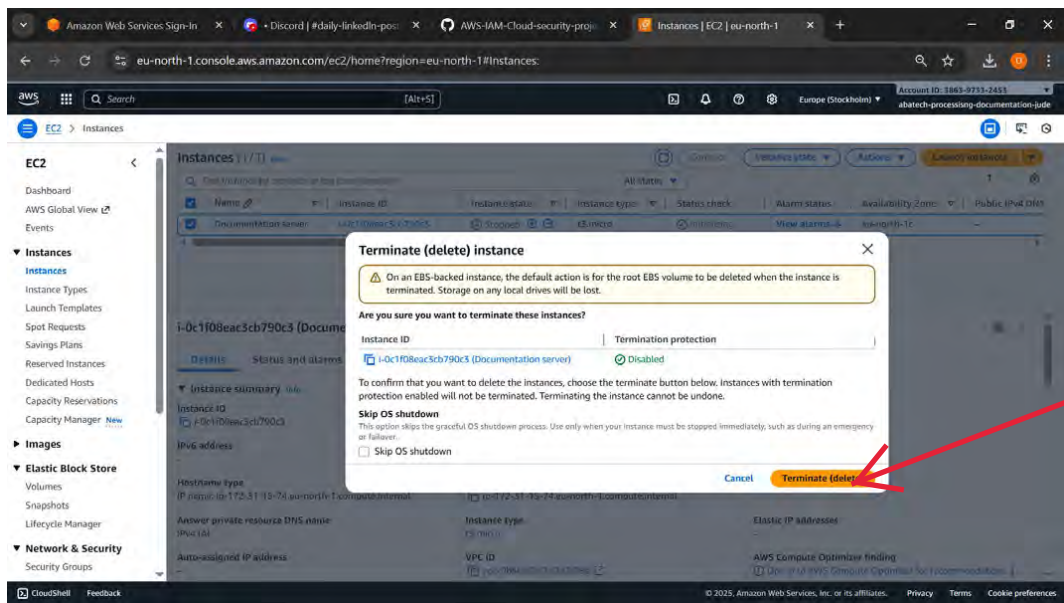
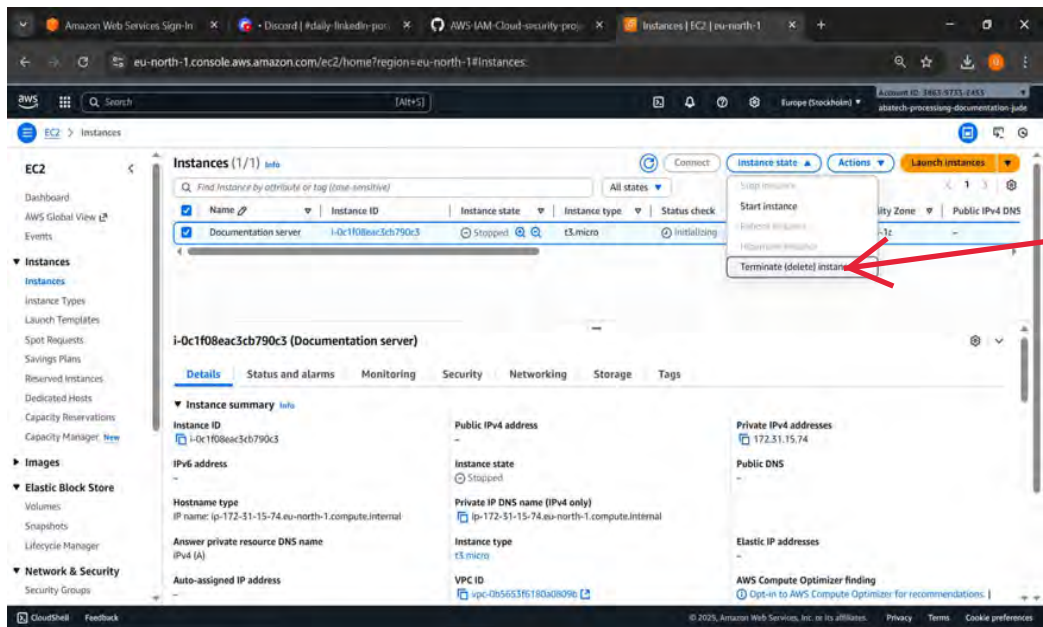
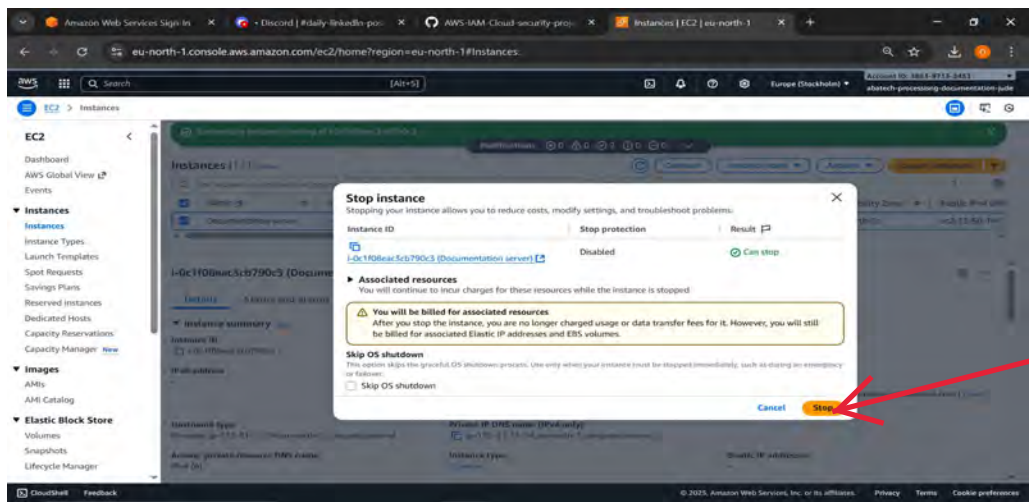












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eu-north-1.console.aws.amazon.com/ec2/home?region=eu-north-1#instances:

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EC2 Instances

Dashboard AWS Global View Events

▼ Instances

- Instances
- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans
- Reserved Instances
- Dedicated Hosts
- Capacity Reservations
- Capacity Manager **New**

► Images

▼ Elastic Block Store

- Volumes
- Snapshots
- Lifecycle Manager

▼ Network & Security

- Security Groups

Successfully initiated termination (deletion) of i-0c1f08eac3cb790c3

Instances (1/1) Info

Find instance by attribute or tag (case-sensitive)

All states

Connect Instance state Actions Launch instances

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
Documentation server	i-0c1f08eac3cb790c3	Shutting-down	t3.micro	initializing	View alarms +	eu-north-1c	

i-0c1f08eac3cb790c3 (Documentation server)

Details Status and alarms Monitoring Security Networking Storage Tags

▼ Instance summary Info

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0c1f08eac3cb790c3	-	-

IPv6 address	Instance state	Public DNS
-	Shutting-down	-

Hostname type	Instance type	Elastic IP addresses
-	t3.micro	-

Answer private resource DNS name	VPC ID	AWS Compute Optimizer finding
-	-	Opt-in to AWS Compute Optimizer for recommendations

Auto-assigned IP address

CloudShell Feedback

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eu-north-1.console.aws.amazon.com/ec2/home?region=eu-north-1#instances:

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EC2 Instances

Dashboard AWS Global View Events

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Instances (1) Info

Find instance by attribute or tag (case-sensitive)

All states

Connect Instance state Actions Launch instances

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
Documentation server	i-0c1f08eac3cb790c3	Terminated	t3.micro	-	View alarms +	eu-north-1c	-

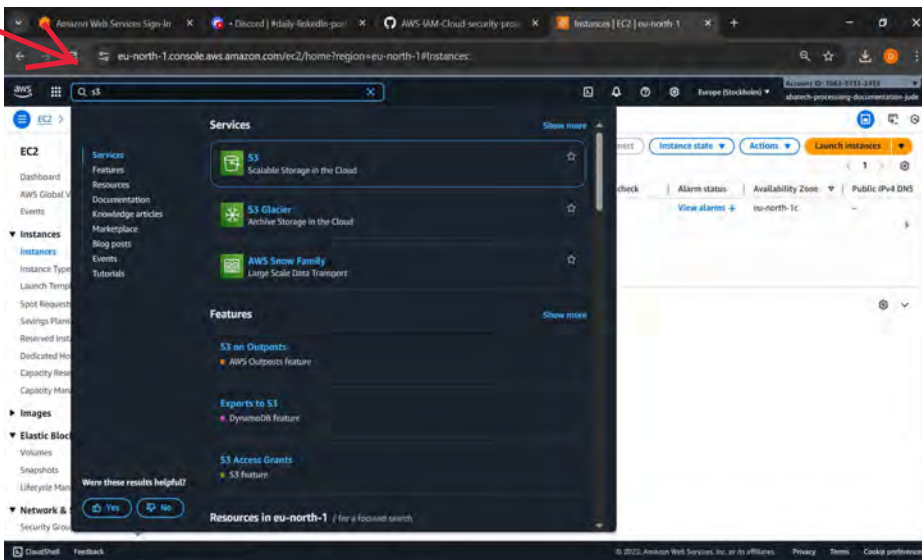
Select an instance

CloudShell Feedback

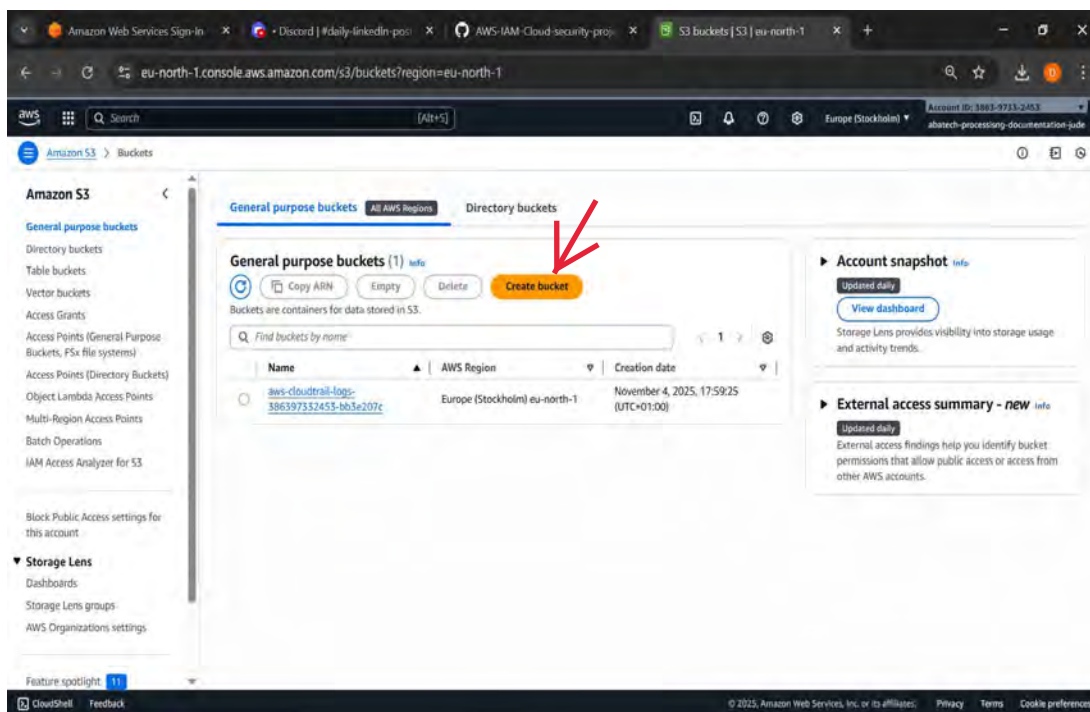
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CREATING S3 BUCKET

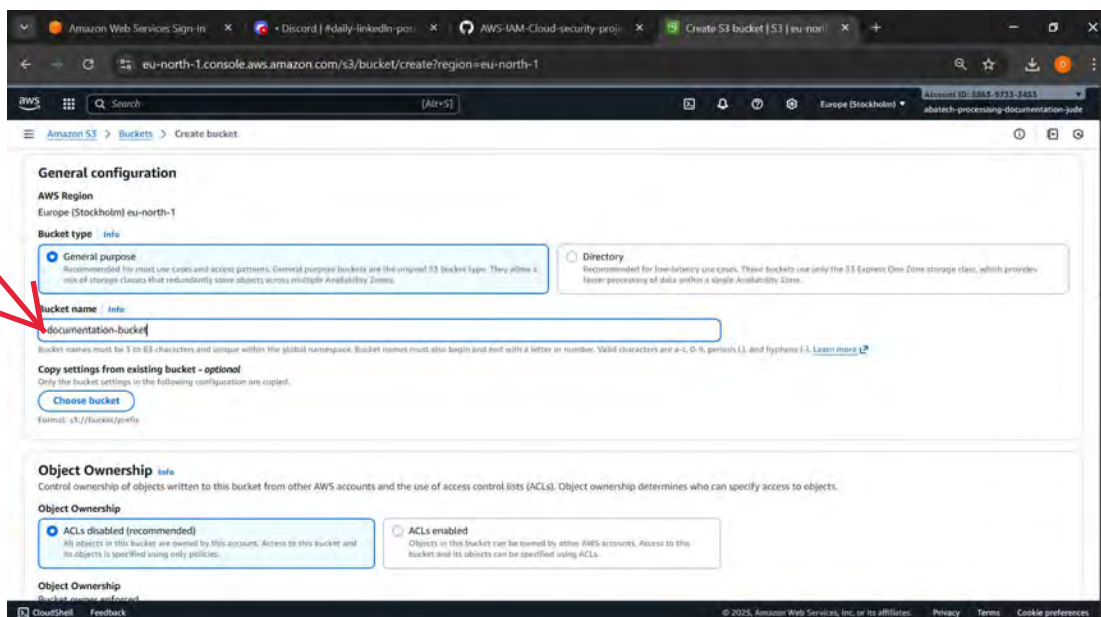
type in s3 into the AWS search box

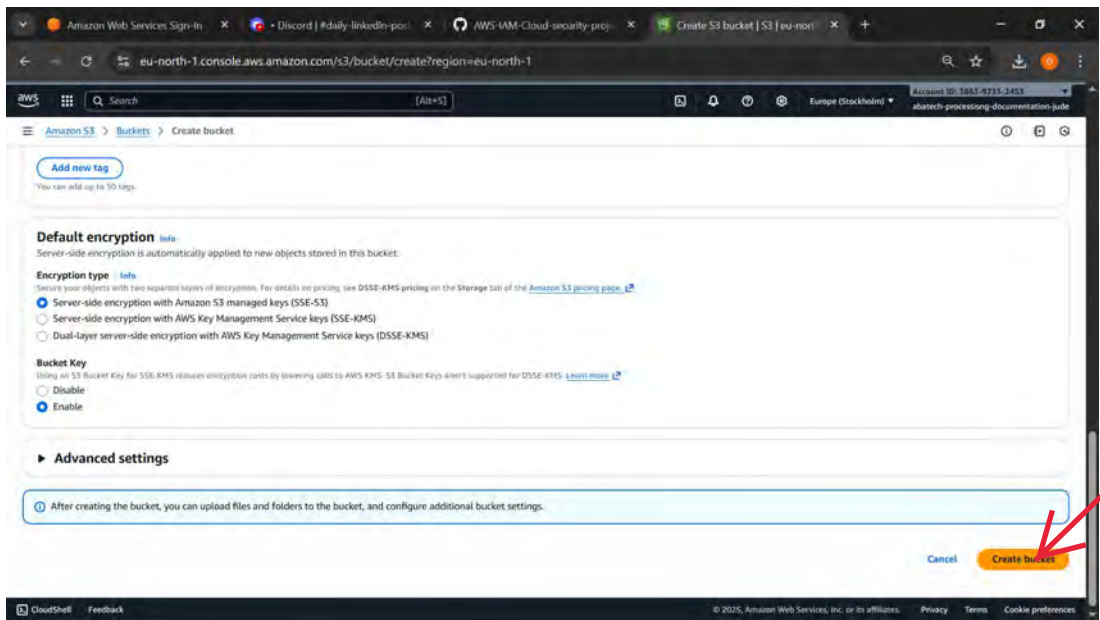
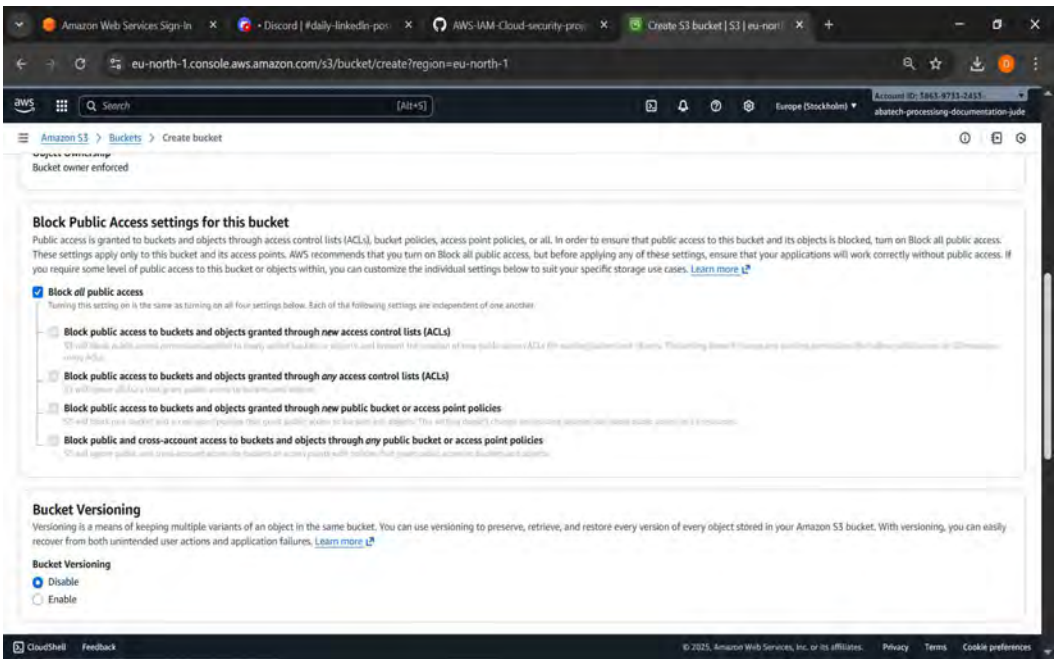


create a bucket

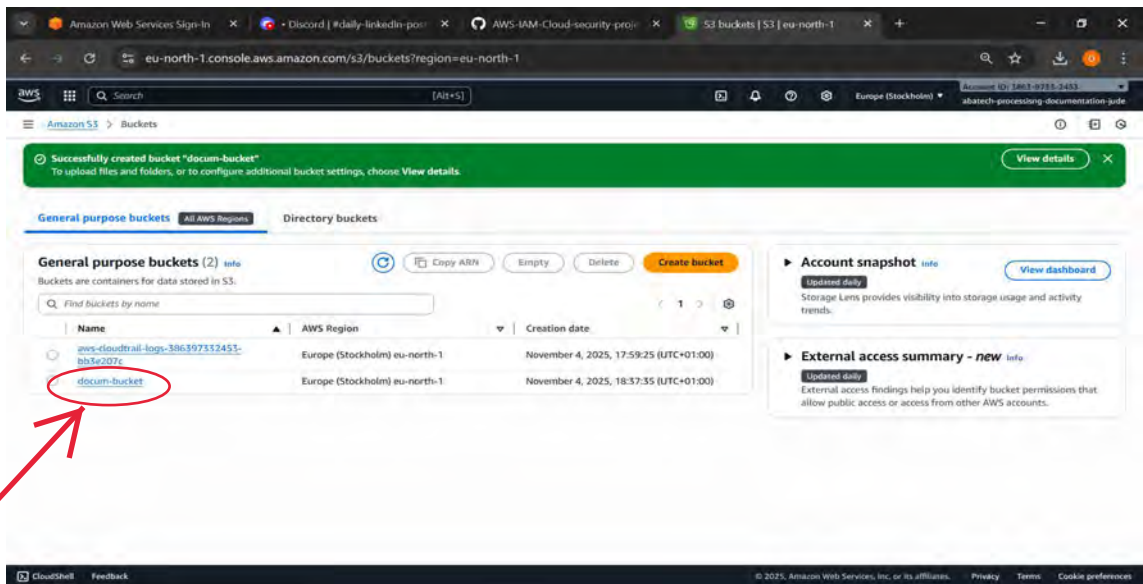


create bucket name

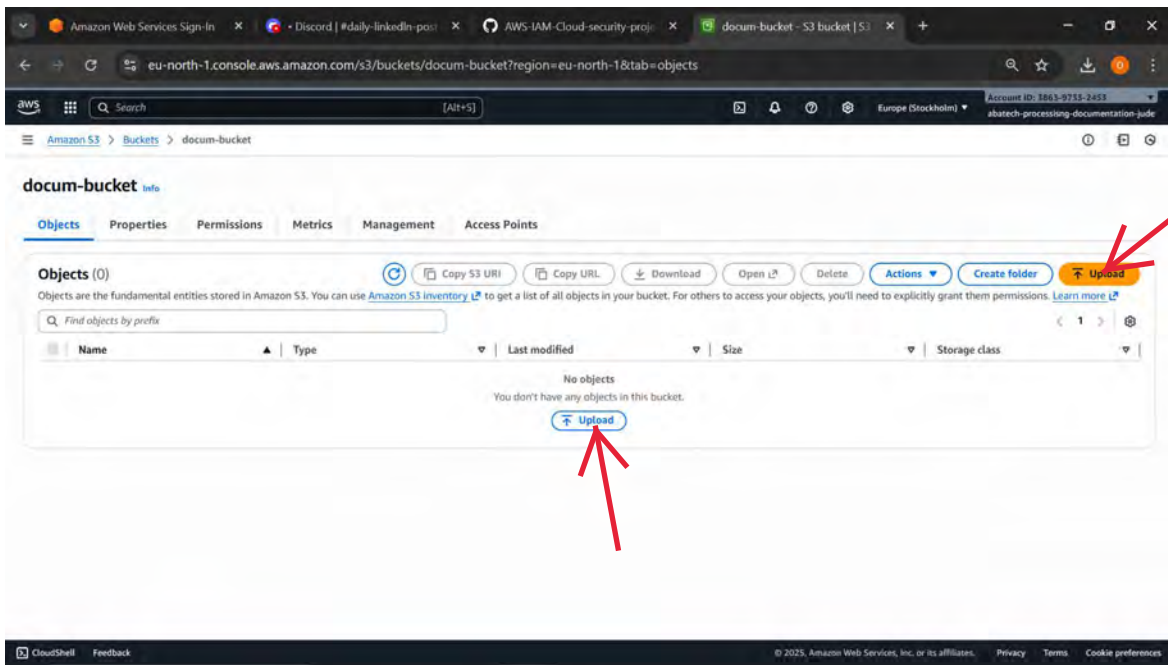




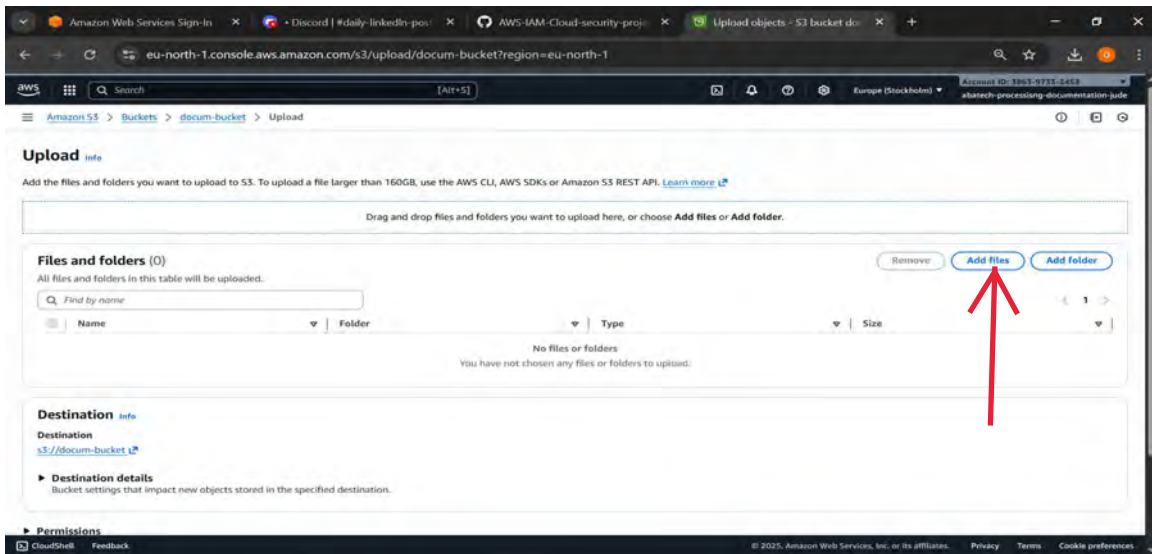
create bucket



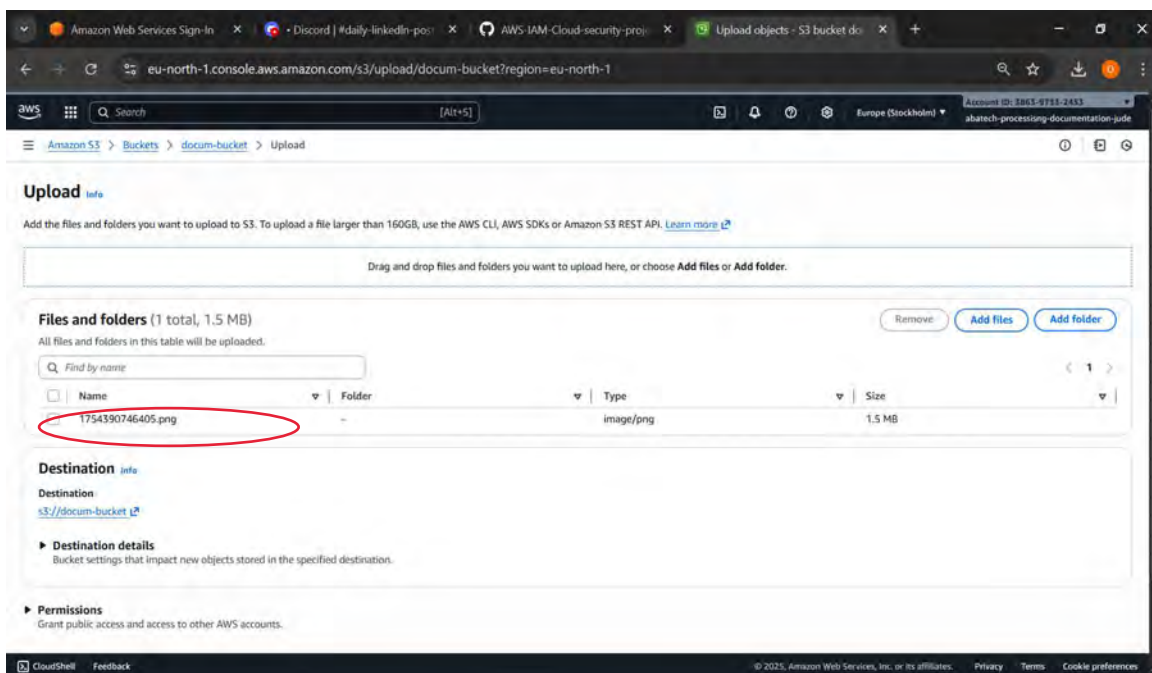
click the created bucket



upload a desired file



add file



file now added

Amazon Web Services Sign-In x Discord | #daily-linkedln-post x AWS-IAM-Cloud-security-proje x Upload objects - S3 bucket doc x +

eu-north-1.console.aws.amazon.com/s3/upload/docum-bucket?region=eu-north-1

aws Search [Alt+S] Europe (Stockholm) Account ID: 3863-9733-2453 abatech-processing-documentation-jude

Amazon S3 > Buckets > docum-bucket > Upload

Upload Info

Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDKs or Amazon S3 REST API. [Learn more](#)

Drag and drop files and folders you want to upload here, or choose [Add files](#) or [Add folder](#).

Files and folders (1 total, 1.5 MB)

All files and folders in this table will be uploaded.

Find by name

<input checked="" type="checkbox"/>	Name	Folder	Type	Size
<input checked="" type="checkbox"/>	1754390746405.png	-	image/png	1.5 MB

[Remove](#) [Add files](#) [Add folder](#)

Destination Info

Destination

[s3://docum-bucket](#)

Destination details

Bucket settings that impact new objects stored in the specified destination.

Permissions

Grant public access and access to other AWS accounts.

CloudShell Feedback

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you can
also
decide to
remove
file from
the bucket