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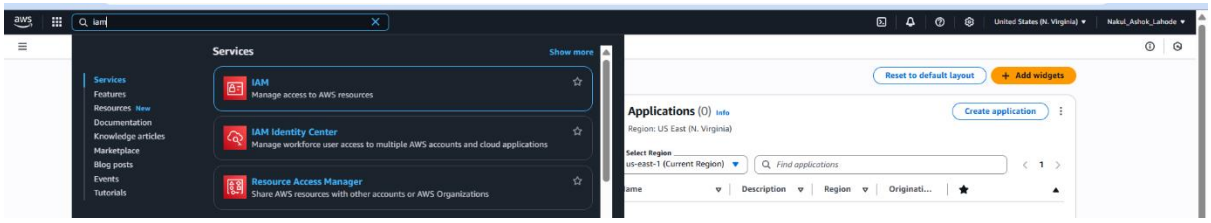
Task - 04 : Implement IAM policies, secure storage, and data encryption on AWS with configured security policies and a report detailing the setup .

Overview of AWS IAM :

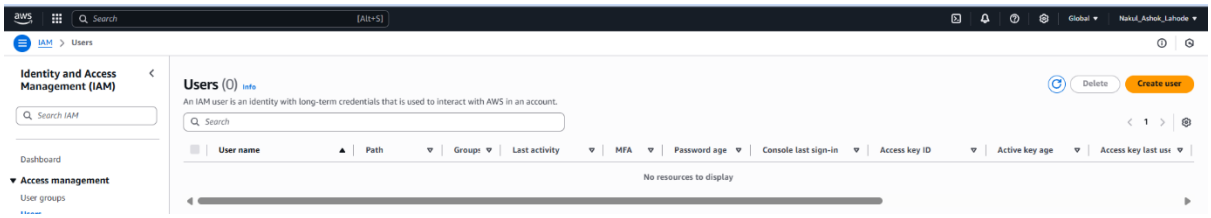
1. **User and Access Management**
    - IAM allows you to create and manage users, groups, and roles, and control their access to AWS services.
2. **Policy-Based Permissions**
    - Access is granted through JSON-based policies that define what actions are allowed or denied on specific AWS resources.
3. **Least Privilege Principle**
    - IAM supports fine-grained control, ensuring users only have the minimum permissions needed to perform their tasks.
4. **Multi-Factor Authentication (MFA)**
    - Enhances security by requiring users to provide two forms of authentication (e.g., password + OTP).
5. **Temporary Access via Roles**
    - IAM roles allow secure, temporary access to AWS services for users, applications, or services (e.g., EC2 instances, Lambda functions).
6. **Integration with AWS Services**
    - Works seamlessly with S3, EC2, RDS, Lambda, and other AWS services to secure and manage resource access.
7. **Federated Access Support**
    - Supports identity federation with external identity providers (like Google, Active Directory, SAML) for SSO (Single Sign-On) access**.**

Step 1: Create a New IAM User

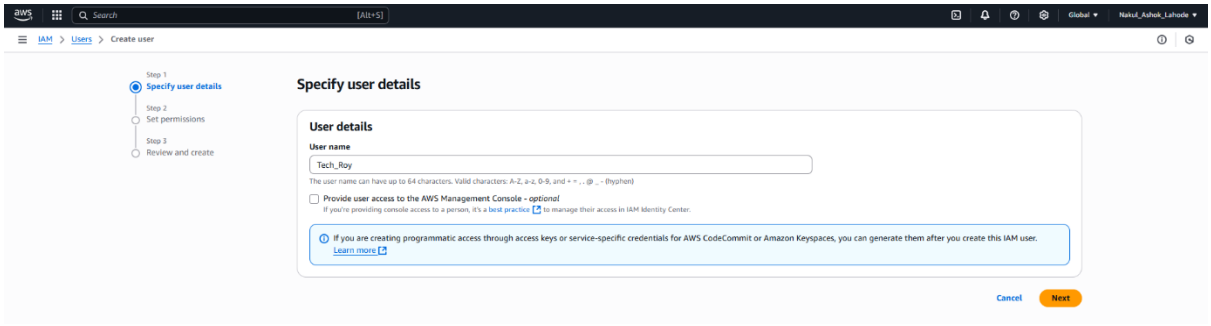
1. Navigate to the IAM service in the AWS Management Console.



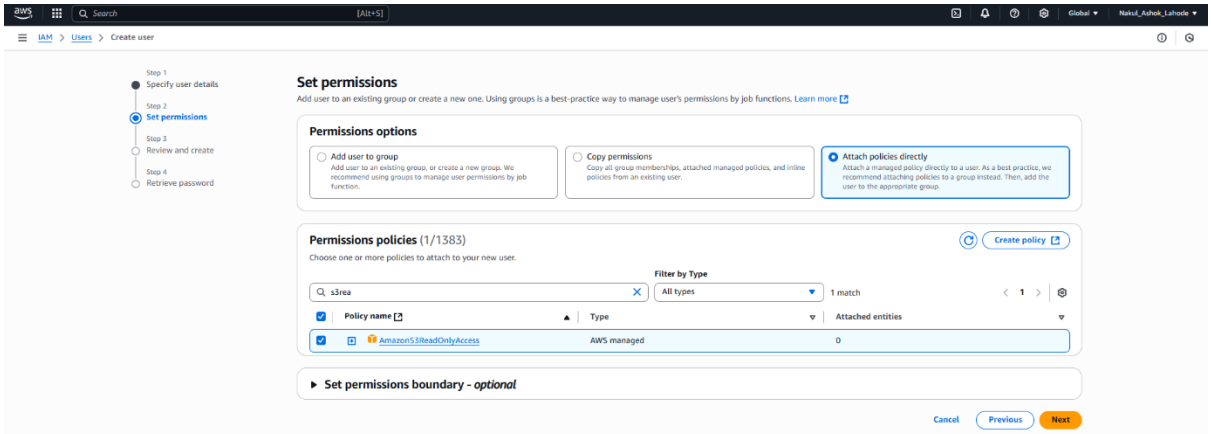
2. Click on “Users” > “Add users”.



3. Enter a suitable username.

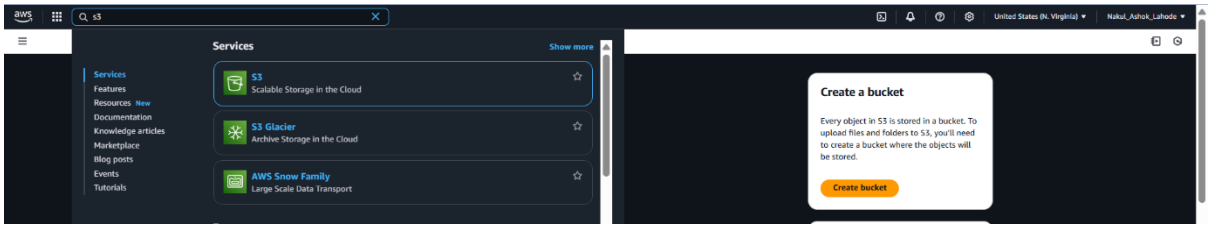


4. Choose the appropriate permissions setting (initially, no permissions or add temporary ones).
5. Review the configuration and click Create User.

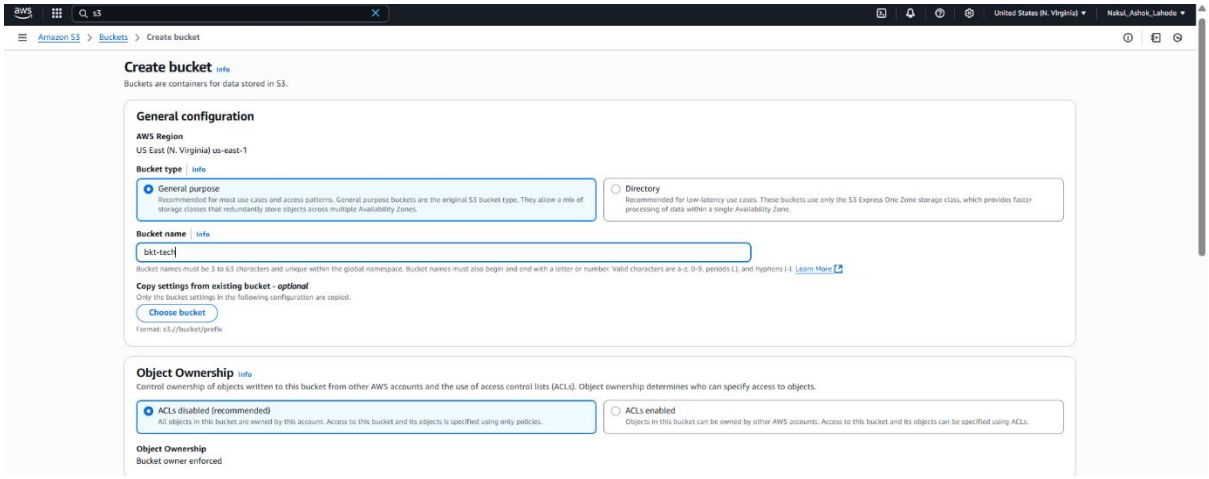


Step 2: Create an S3 Bucket with Encryption

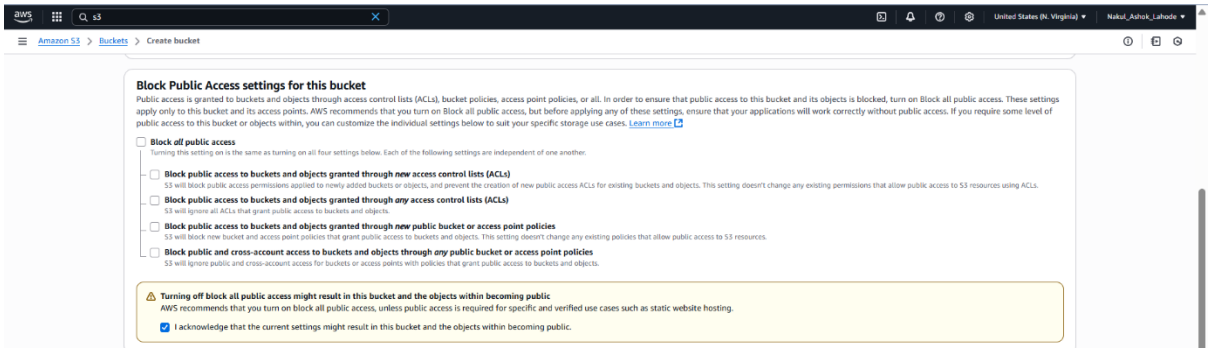
1. Go to the **S3** service.

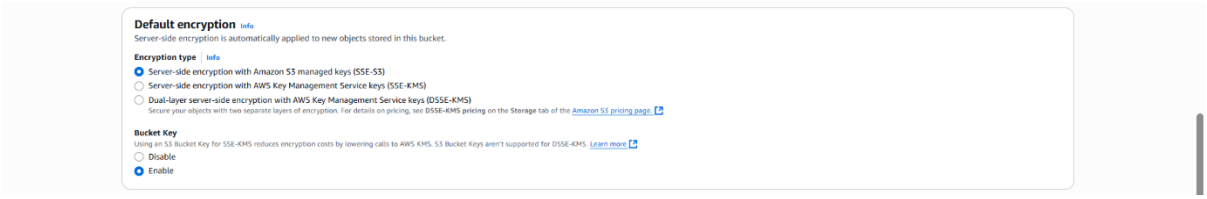


2. Click **Create Bucket** and give it a unique name.



3. Optionally, enable or disable **Block Public Access** depending on your requirement (in this case, allow access for testing IAM).
4. Under **Bucket Settings for Default Encryption**:
    - Choose **"Enable"**.
    - Select **"Amazon S3 managed keys (SSE-S3)"** for server-side encryption.

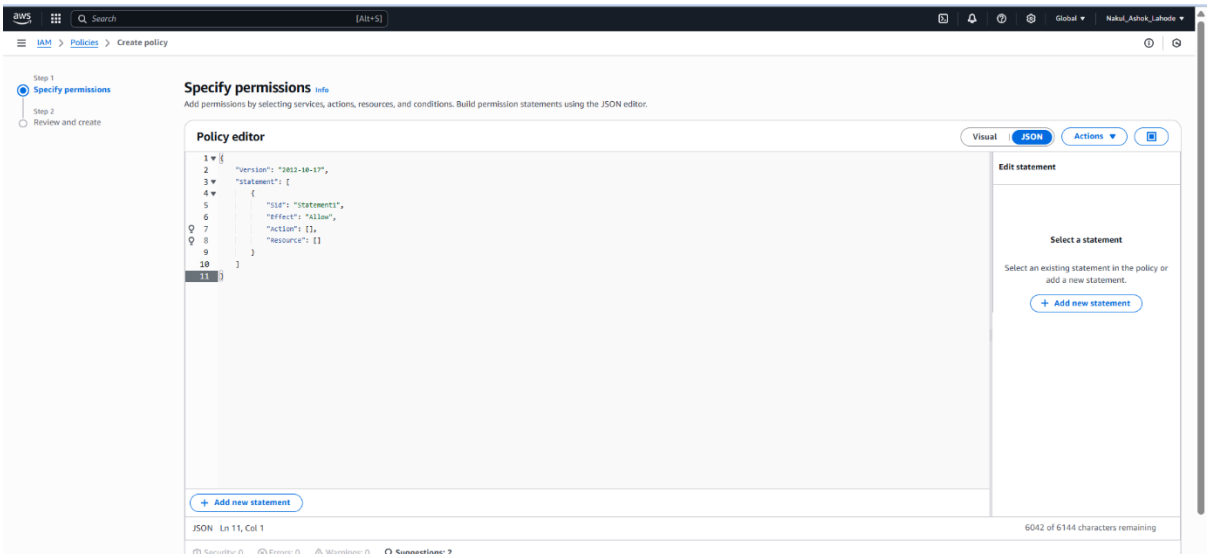




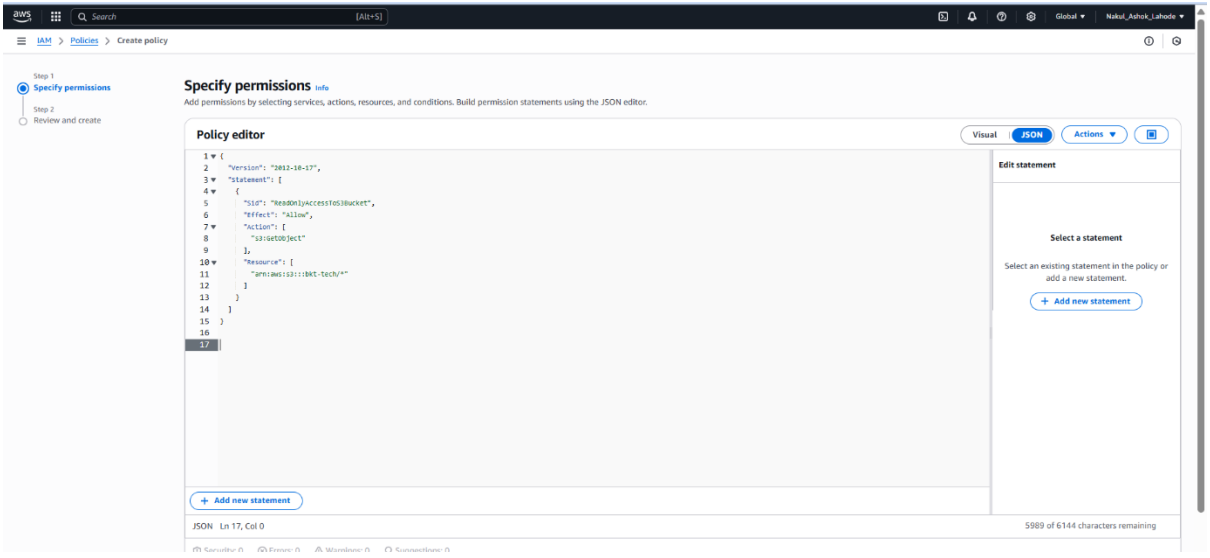
5. Click **Create Bucket**.

Step 3: Create a Custom IAM Policy

1. In the IAM dashboard, go to Policies > Create Policy.
2. Choose the JSON tab and paste your custom policy (e.g., restrict access to specific bucket).

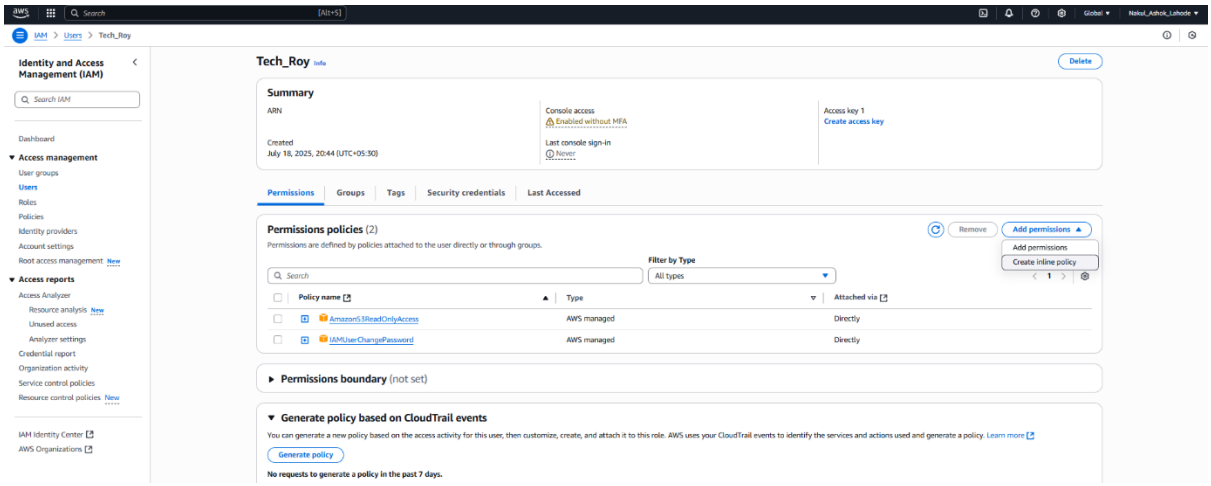


3. Click Next, give the policy a proper name, and then create it.

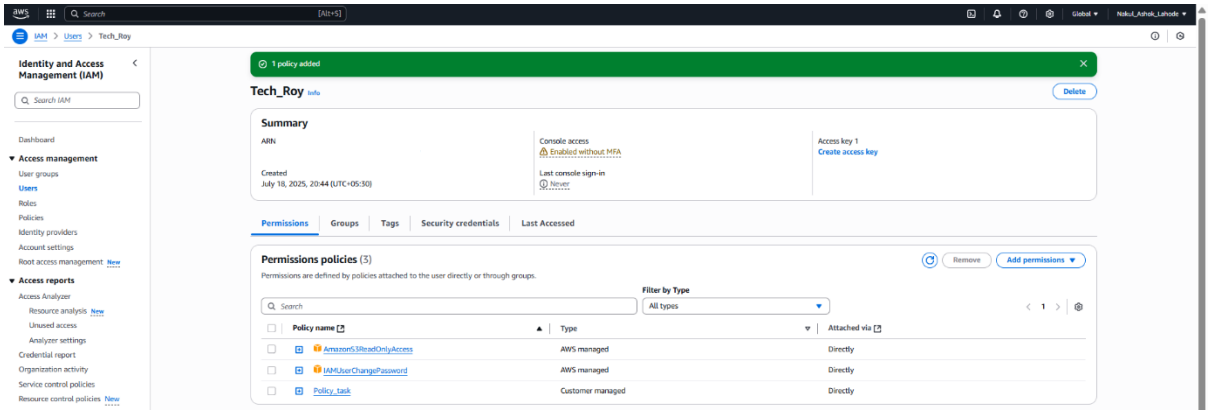


Step 4: Attach the Policy to the IAM User

1. Go to **IAM > Users**, select the newly created user.
2. Click on **“Add Permissions”**.

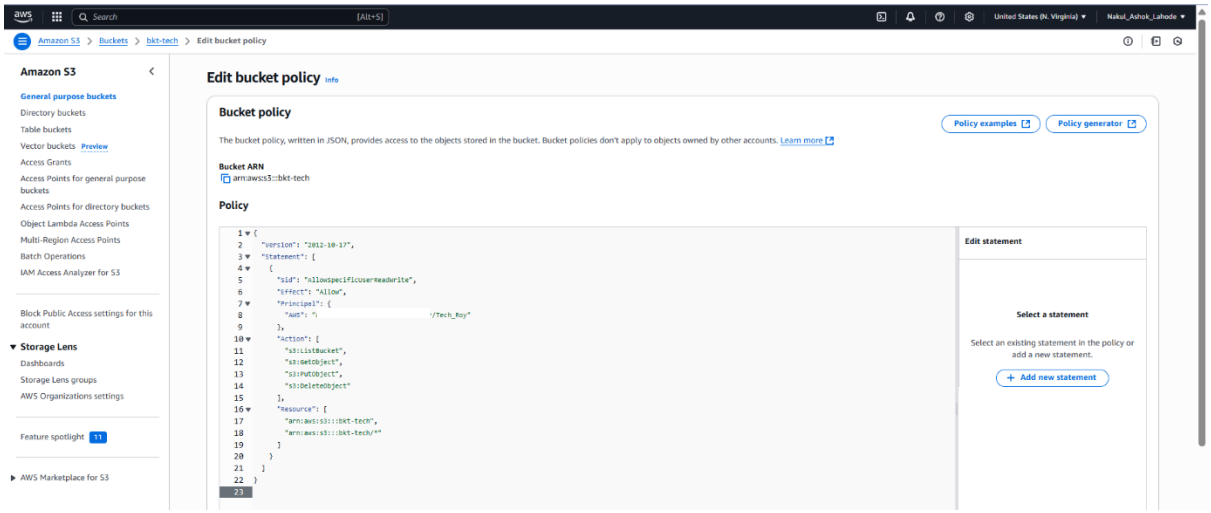


3. Choose **“Attach existing policies directly”**.
4. Select the **custom policy** you created earlier.
5. Review and click **Add Permissions**.



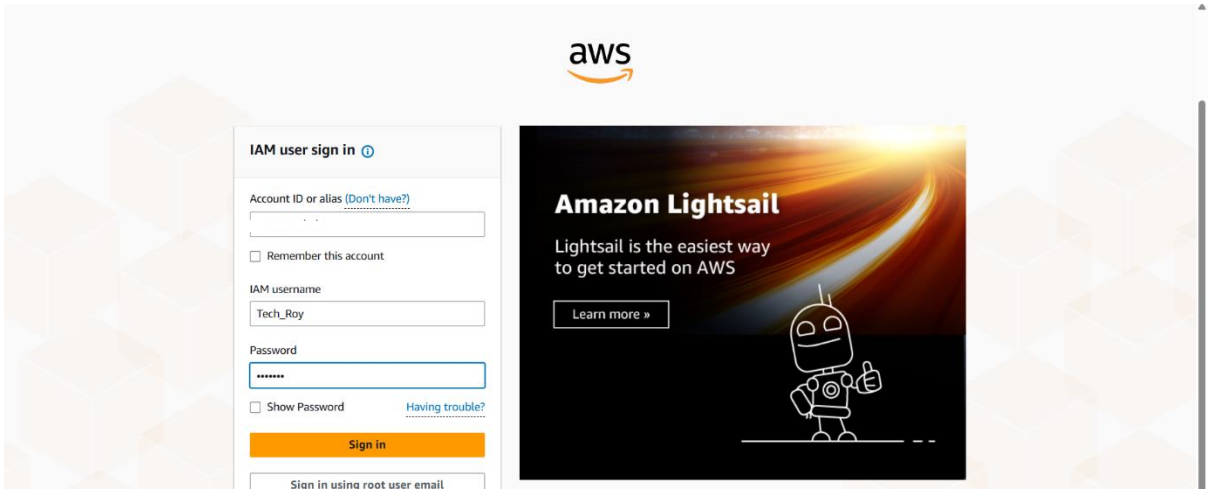
Step 5: Create & Apply Bucket Policy

1. Go to the **S3 bucket**.
2. Navigate to the **Permissions** tab.
3. Click **Bucket Policy** and paste a policy that allows only the specific IAM user to access the bucket.

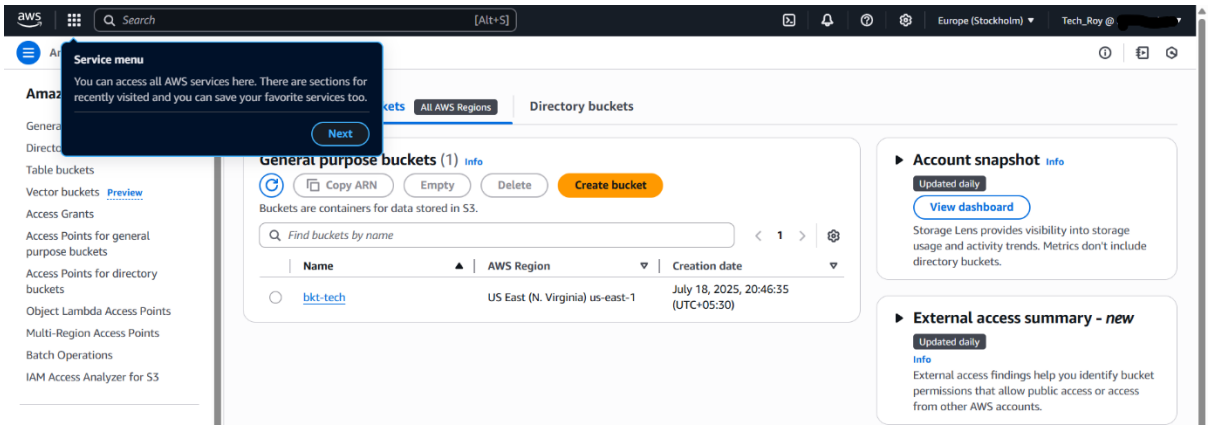


Step 6: Validate the Access Control

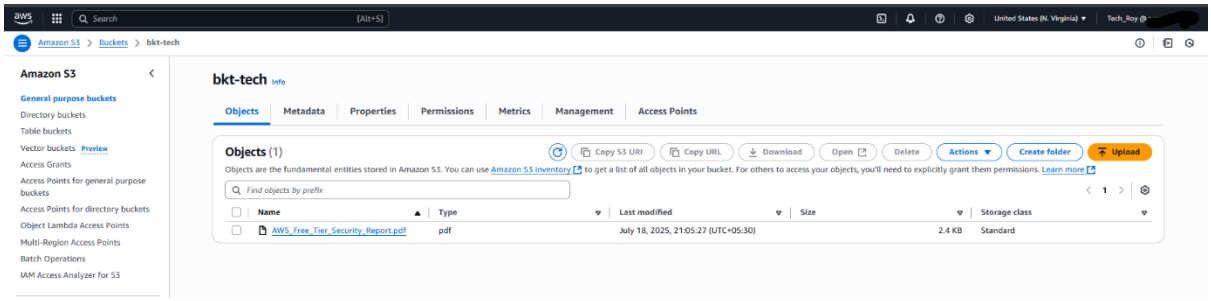
1. **Sign in** to AWS as the newly created IAM user (use the custom login link provided in IAM).



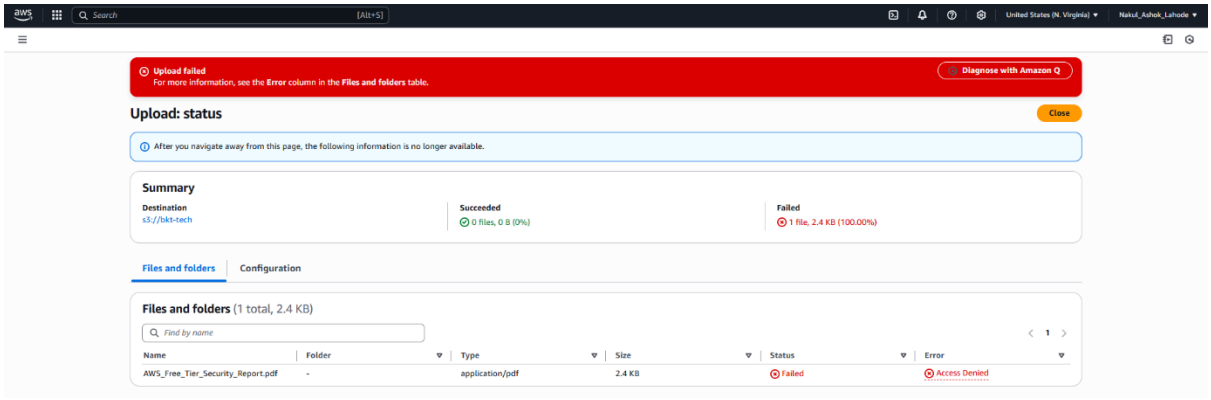
2. Navigate to **S3**, open the specific bucket.



3. Try uploading a file. It should **succeed**.



4. Now switch to a **different user or root user**, and try uploading the same file.
5. This action should result in an **Access Denied error**.



6. This confirms that the policy is working as intended.