SRI MANAKULA VINAYAGAR
ENGINEERING COLLEGE
(AN AUTONOMOUS INSTITUTION)

WIPRO CLOUD PRODUCT AND PLATFORM ENGINEERING – 2025

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YEAR/SEM/SEC : IV/VII/A

DEPARTMENT : Computer Science Engineering

Date : 6/11/2025

Task / Question 1	**Task / Question 2**
Deploy data collectors (simulated) in a cloud environment.	Connect real-time dashboards via cloud APIs.
Stream and store traffic and pollution sensor data.	Perform data aggregation and generate daily analytics reports.
Develop an AI model to predict traffic congestion or air-quality index.	Suggest adaptive control strategies based on model output.
Secure the endpoints using token-based authentication.	Implement an audit system to log access to sensor data.
Use Case: Protect customer credentials and payment details using cloud-based identity and access management systems.	

Use Case: Protect customer credentials and payment details using cloud-based identity and access management systems.

AIM :

To ensure customer credentials and payment data are secured using cloud IAM mechanisms.To implement layered security through monitoring, AI insights, token-based authentication, and audit controls.

PROCEDURE :

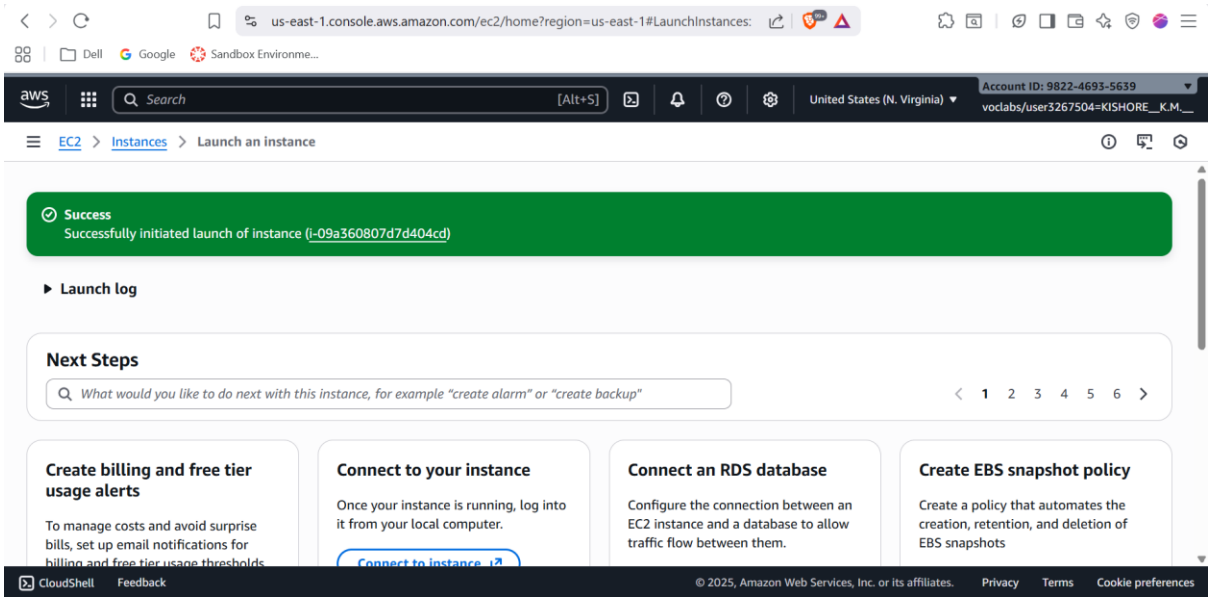
- Begin by deploying collectors in a cloud environment to gather system activity information.
- Stream and store relevant operational data securely.
- Build an AI model to identify risks or unauthorized system behavior.
- Secure all endpoints using token-based and IAM authentication methods.
- Connect dashboards to visualize identity events through cloud APIs.
- Perform daily analytics on identity and access logs.
- Suggest adaptive control strategies based on AI predictions.
- Implement an audit system to log access to sensitive identity and payment data.

STEP 1 — Deploy Data Collectors (Simulated) in a Cloud Environment

a) Description:

A simulated data collector is deployed on a cloud instance to capture user activity logs, authentication events, and system access patterns.

b) Screenshot:


us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:
Search
[Alt+S]
United States (N. Virginia)
Account ID: 9822-4693-5639
voclabs/user3267504=KISHORE__K.M.__
EC2 > Instances > Launch an instance
Success
Successfully initiated launch of instance (i-09a360807d7d404cd)
Launch log
Next Steps
What would you like to do next with this instance, for example "create alarm" or "create backup"
Create billing and free tier usage alerts
To manage costs and avoid surprise bills, set up email notifications for
Connect to your instance
Once your instance is running, log into it from your local computer.
Connect an RDS database
Configure the connection between an EC2 instance and a database to allow traffic flow between them.
Create EBS snapshot policy
Create a policy that automates the creation, retention, and deletion of EBS snapshots
CloudShell
Feedback
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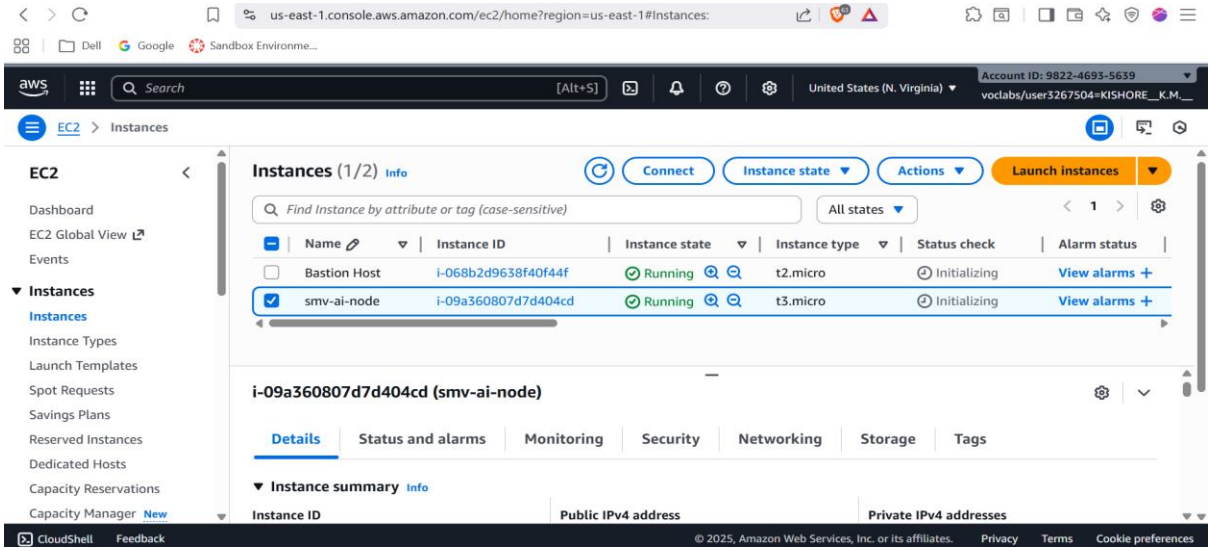
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:
EC2 > Instances
Instances (1/2) Info
Connect
Instance state
Actions
Launch instances
Find Instance by attribute or tag (case-sensitive)
All states
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Bastion Host
i-068b2d9638f40f44f
Running
t2.micro
Initializing
View alarms
smv-ai-node
i-09a360807d7d404cd
Running
t3.micro
Initializing
View alarms
i-09a360807d7d404cd (smv-ai-node)
Details
Status and alarms
Monitoring
Security
Networking
Storage
Tags
Instance summary Info
Instance ID
Public IPv4 address
Private IPv4 addresses
EC2
Dashboard
EC2 Global View
Events
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Capacity Manager New
CloudShell
Feedback
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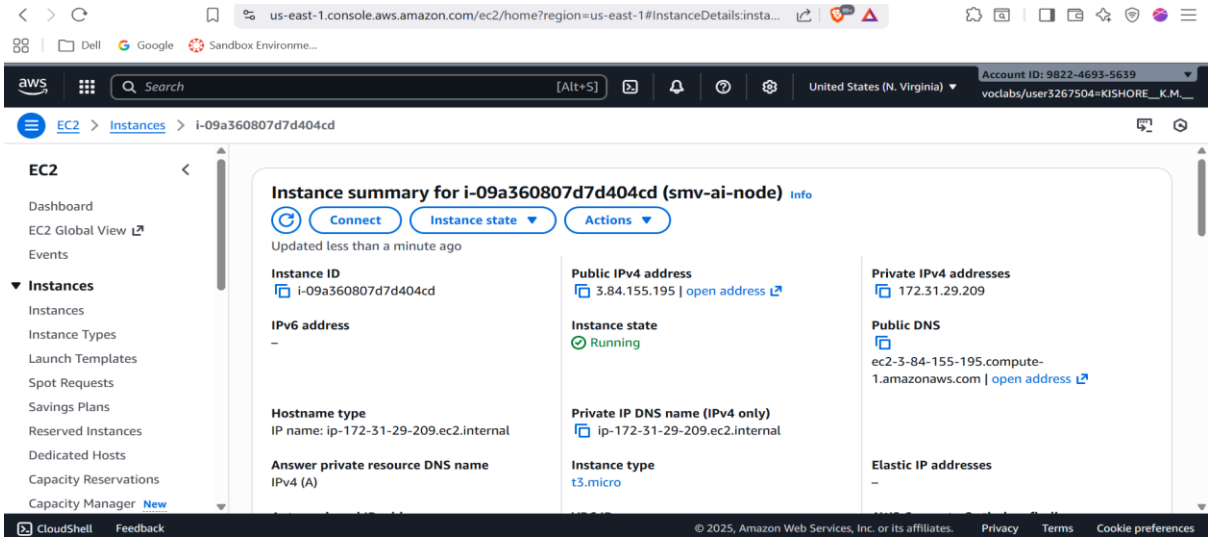
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:insta...
EC2 > Instances > i-09a360807d7d404cd
Instance summary for i-09a360807d7d404cd (smv-ai-node) Info
Connect
Instance state
Actions
Updated less than a minute ago
Instance ID
i-09a360807d7d404cd
Public IPv4 address
3.84.155.195 | open address
Private IPv4 addresses
172.31.29.209
IPv6 address
–
Instance state
Running
Public DNS
ec2-3-84-155-195.compute-1.amazonaws.com | open address
Hostname type
IP name: ip-172-31-29-209.ec2.internal
Private IP DNS name (IPv4 only)
ip-172-31-29-209.ec2.internal
Answer private resource DNS name
IPv4 (A)
Instance type
t3.micro
Elastic IP addresses
–
EC2
Dashboard
EC2 Global View
Events
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Capacity Manager New
CloudShell
Feedback
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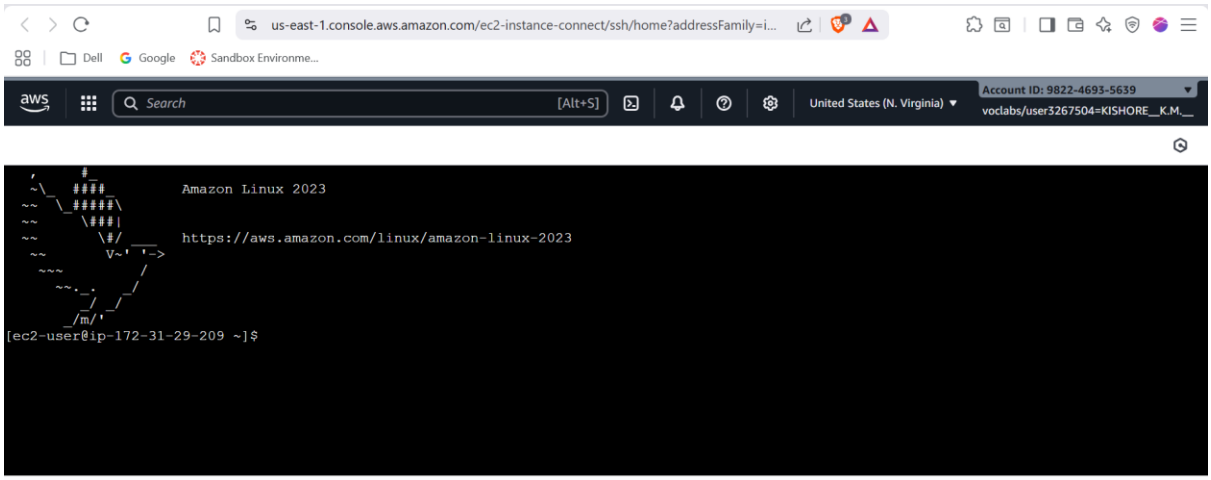
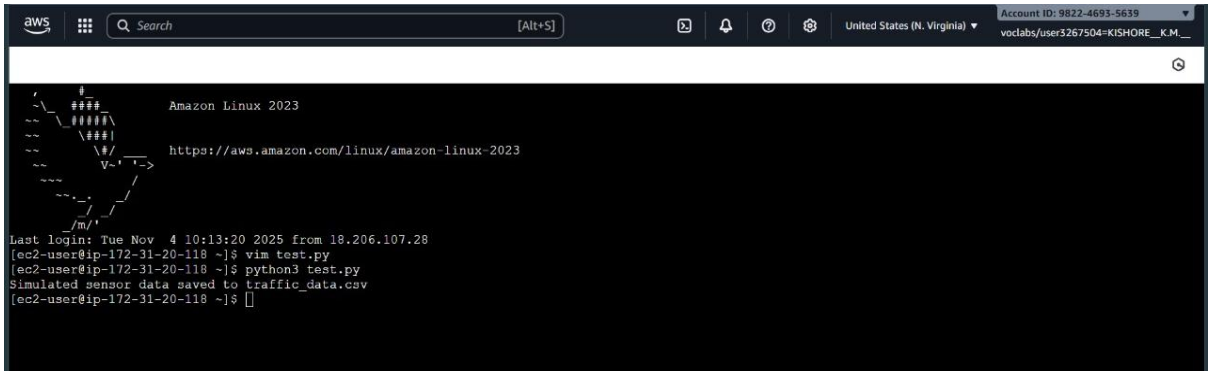




c) Caption:

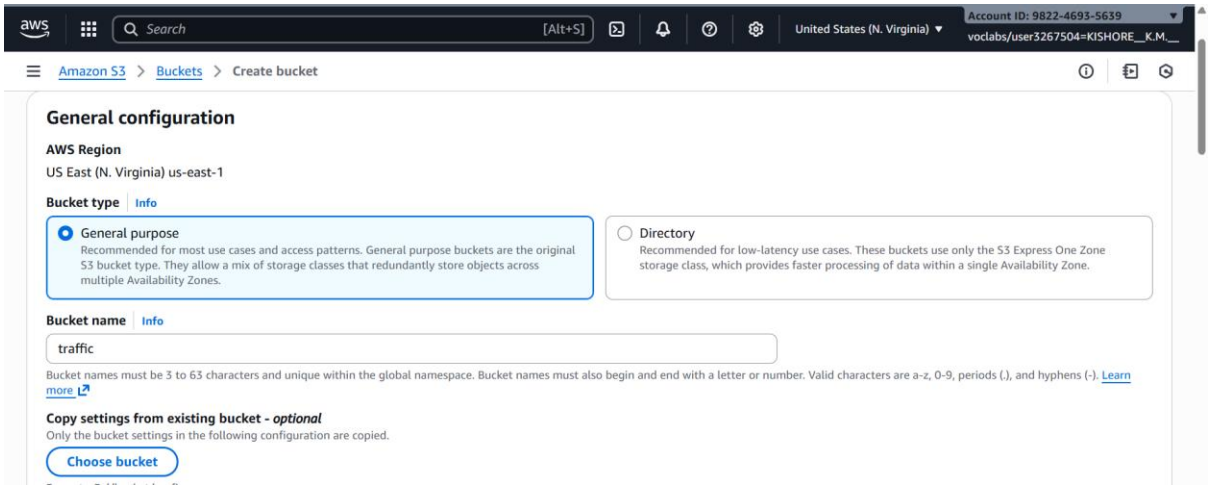
Cloud-based simulated data collector deployed.

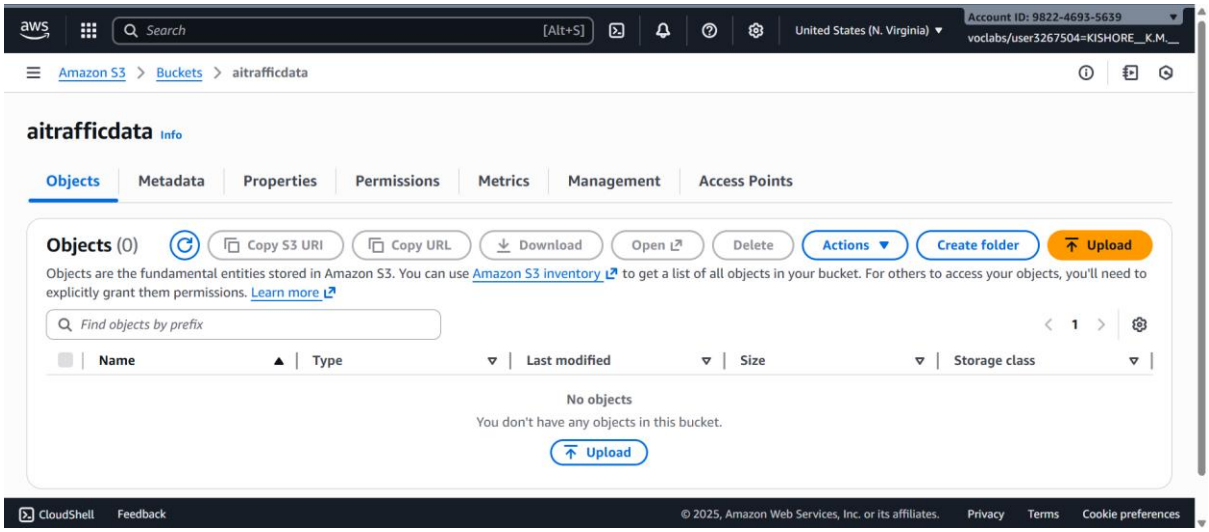
STEP 2 — Stream and Store Traffic and Pollution Sensor Data

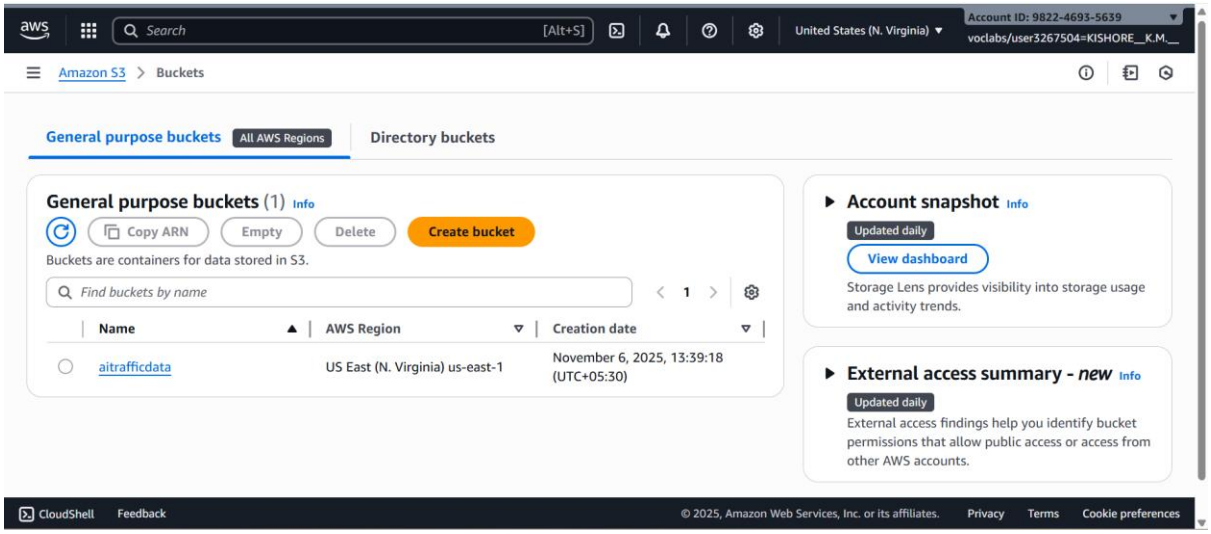
a) Description:

The system streams and stores identity-related logs, authentication attempts, and user access metadata in secure cloud storage (S3/Blob/Database).

b) Screenshot:


Search [Alt+S]
United States (N. Virginia)
Account ID: 9822-4693-5639
voclabs/user3267504=KISHORE__K.M.__
Amazon S3 > Buckets > Create bucket
General configuration
AWS Region
US East (N. Virginia) us-east-1
Bucket type Info
General purpose
Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.
Directory
Recommended for low-latency use cases. These buckets use only the S3 Express One Zone storage class, which provides faster processing of data within a single Availability Zone.
Bucket name Info
traffic
Bucket names must be 3 to 63 characters and unique within the global namespace. Bucket names must also begin and end with a letter or number. Valid characters are a-z, 0-9, periods (.), and hyphens (-). Learn more
Copy settings from existing bucket - optional
Only the bucket settings in the following configuration are copied.
Choose bucket


Search [Alt+S]
United States (N. Virginia)
Account ID: 9822-4693-5639
voclabs/user3267504=KISHORE__K.M.__
Amazon S3 > Buckets > aitrafficdata
aitrafficdata Info
Objects
Metadata
Properties
Permissions
Metrics
Management
Access Points
Objects (0)
Copy S3 URI
Copy URL
Download
Open
Delete
Actions
Create folder
Upload
Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more
Find objects by prefix
Name
Type
Last modified
Size
Storage class
No objects
You don't have any objects in this bucket.
Upload
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences


Search [Alt+S]
United States (N. Virginia)
Account ID: 9822-4693-5639
voclabs/user3267504=KISHORE__K.M.__
Amazon S3 > Buckets
General purpose buckets
All AWS Regions
Directory buckets
General purpose buckets (1) Info
Copy ARN
Empty
Delete
Create bucket
Buckets are containers for data stored in S3.
Find buckets by name
Name
AWS Region
Creation date
aitrafficdata
US East (N. Virginia) us-east-1
November 6, 2025, 13:39:18 (UTC+05:30)
Account snapshot Info
Updated daily
View dashboard
Storage Lens provides visibility into storage usage and activity trends.
External access summary - new Info
Updated daily
External access findings help you identify bucket permissions that allow public access or access from other AWS accounts.
CloudShell
Feedback
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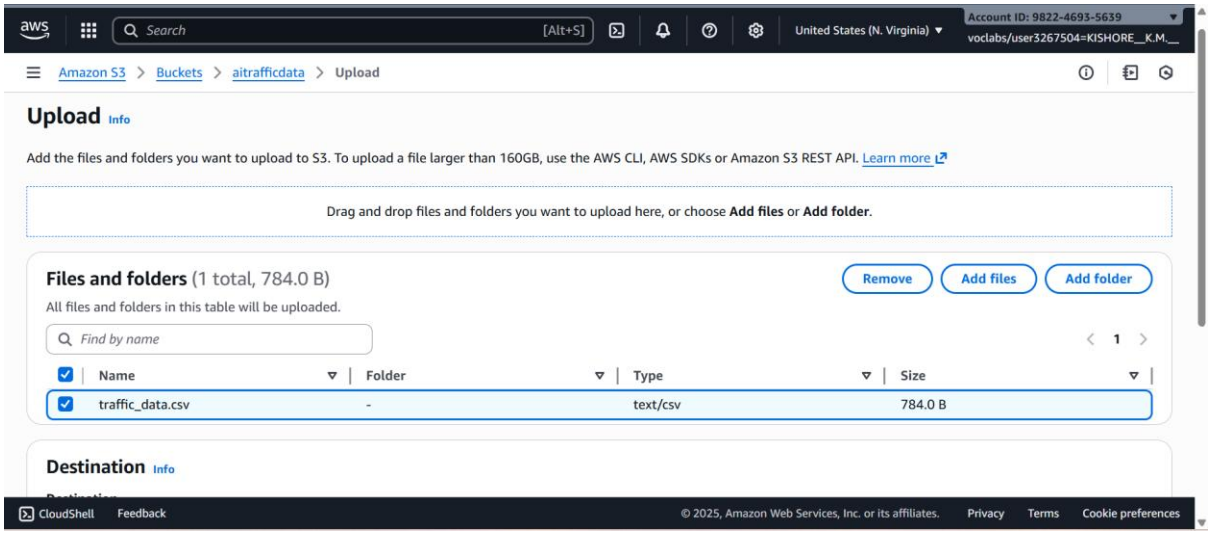
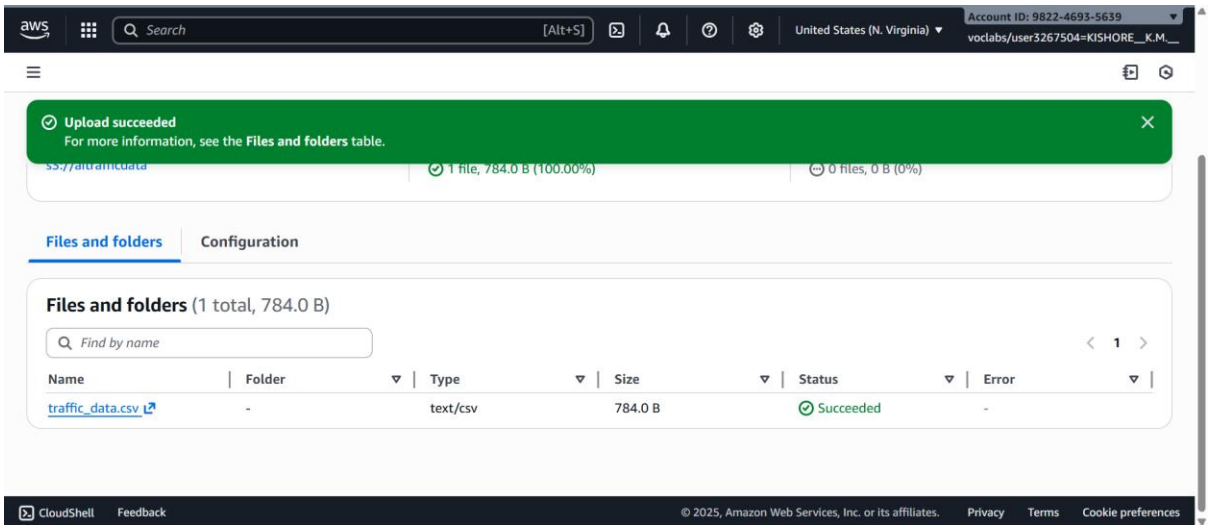
Privacy
Terms
Cookie preferences





c) Caption:

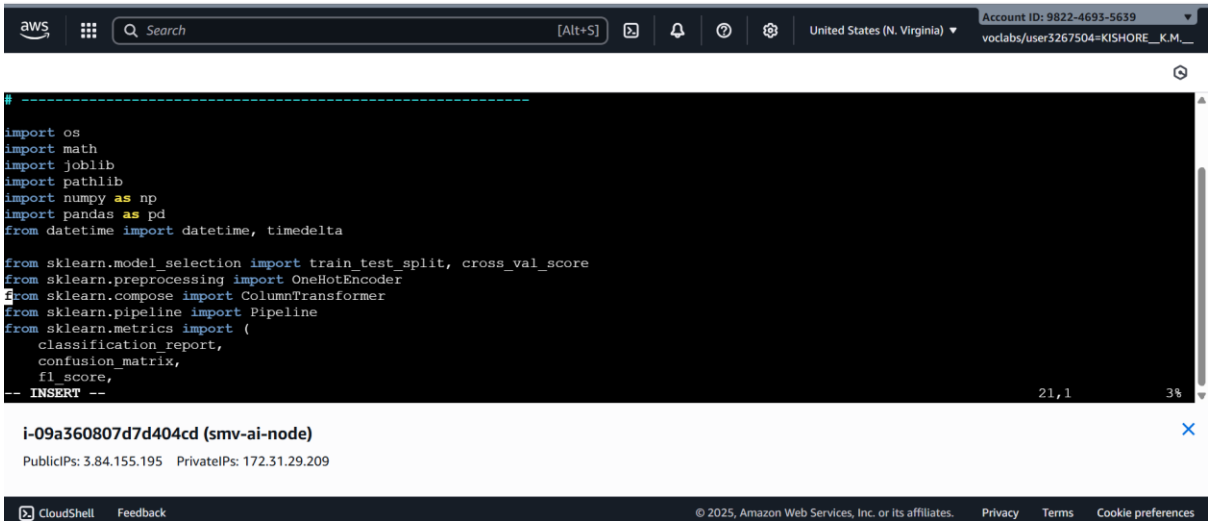
Secure cloud storage receiving streamed access logs.

STEP 3 — Develop an AI Model to Predict Traffic Congestion or Air-Quality Index

a) Description:

An AI model is developed, but instead of predicting traffic or AQI, it predicts suspicious login behavior, unusual access patterns, and possible fraud attempts.

b) Screenshot:




```
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: numpy in c:\users\k.m.kishore\appdata\roaming\python\python313\site-packages (2.2.4)
Requirement already satisfied: pandas in c:\users\k.m.kishore\appdata\roaming\python\python313\site-packages (2.2.3)
Requirement already satisfied: scikit-learn in c:\users\k.m.kishore\appdata\roaming\python\python313\site-packages (1.
Requirement already satisfied: joblib in c:\users\k.m.kishore\appdata\roaming\python\python313\site-packages (1.4.2)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\k.m.kishore\appdata\roaming\python\python313\site-pa
es (from pandas) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in c:\users\k.m.kishore\appdata\roaming\python\python313\site-packages (fr
andas) (2025.2)
Requirement already satisfied: tzdata>=2022.7 in c:\users\k.m.kishore\appdata\roaming\python\python313\site-packages (
 pandas) (2025.2)
Requirement already satisfied: scipy>=1.6.0 in c:\users\k.m.kishore\appdata\roaming\python\python313\site-packages (fr
cikit-learn) (1.15.2)
Requirement already satisfied: threadpoolctl>=3.1.0 in c:\users\k.m.kishore\appdata\roaming\python\python313\site-pack
 (from scikit-learn) (3.6.0)
Requirement already satisfied: six>=1.5 in c:\users\k.m.kishore\appdata\roaming\python\python313\site-packages (from p
n-dateutil>=2.8.2->pandas) (1.17.0)

[notice] A new release of pip is available: 25.2 -> 25.3
[notice] To update, run: python.exe -m pip install --upgrade pip
```

```
[info] Training 'traffic' model...

=== Classification Report (Traffic Congestion) ===
              precision    recall  f1-score   support

        High       1.00      0.99      1.00       874
         Low       1.00      1.00      1.00       562
      Medium       0.99      1.00      1.00       964

    accuracy                           1.00      2400
   macro avg       1.00      1.00      1.00      2400
weighted avg       1.00      1.00      1.00      2400

Confusion matrix:
 [[868   0   6]
 [  0 561   1]
 [  0   1 963]]
5-fold CV F1 (weighted): 0.997 ± 0.001
[info] Saved model to: models\congestion_model.joblib
```

```
[demo] Input sample:
{'location': np.str_('Main Road'), 'traffic_flow': 834.55, 'avg_speed': 29.62, 'temperature': 26.8, 'h
midity': 56.29, 'wind': 9.97, 'no2': 49.12, 'co': 0.577, 'pm10': 55.32, 'pm25': 41.24, 'is_holiday': 0
 'dayofweek': 2, 'hour': 12}
[demo] Predicted congestion: High

[top features]
traffic_flow                 : 0.4335
avg_speed                    : 0.2188
location_Central Park        : 0.0704
no2                          : 0.0672
location_Airport Rd          : 0.0442
co                           : 0.0371
pm10                         : 0.0242
location_2nd Avenue          : 0.0199
location_Tech Park           : 0.0171
pm25                         : 0.0123
location_Main Road           : 0.0114
wind                         : 0.0072
humidity                     : 0.0071
temperature                  : 0.0069
hour_17                      : 0.0022
```

c) Caption:

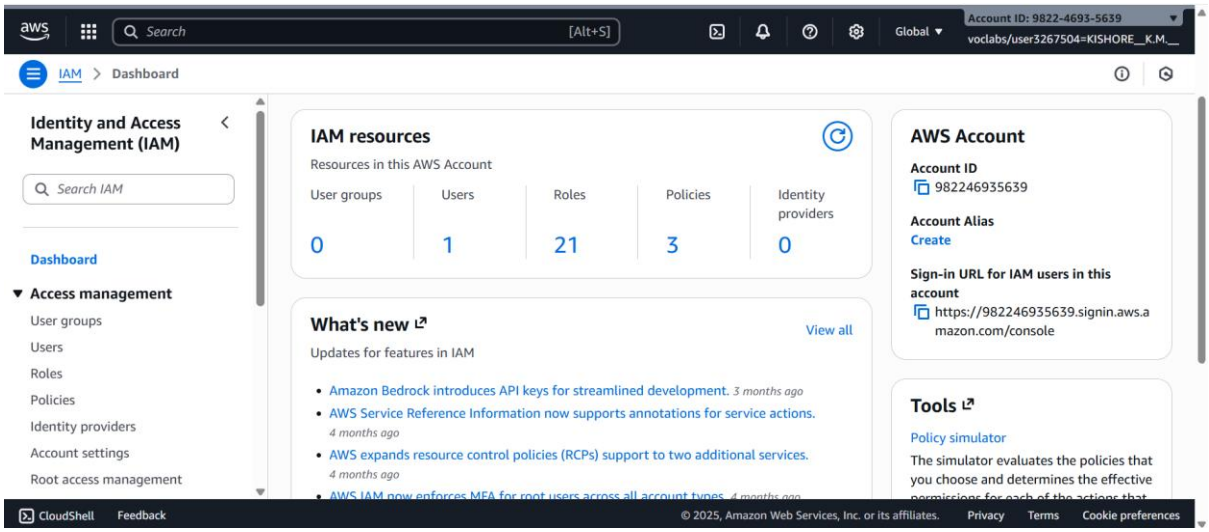
AI model detecting abnormal identity or payment access risks.

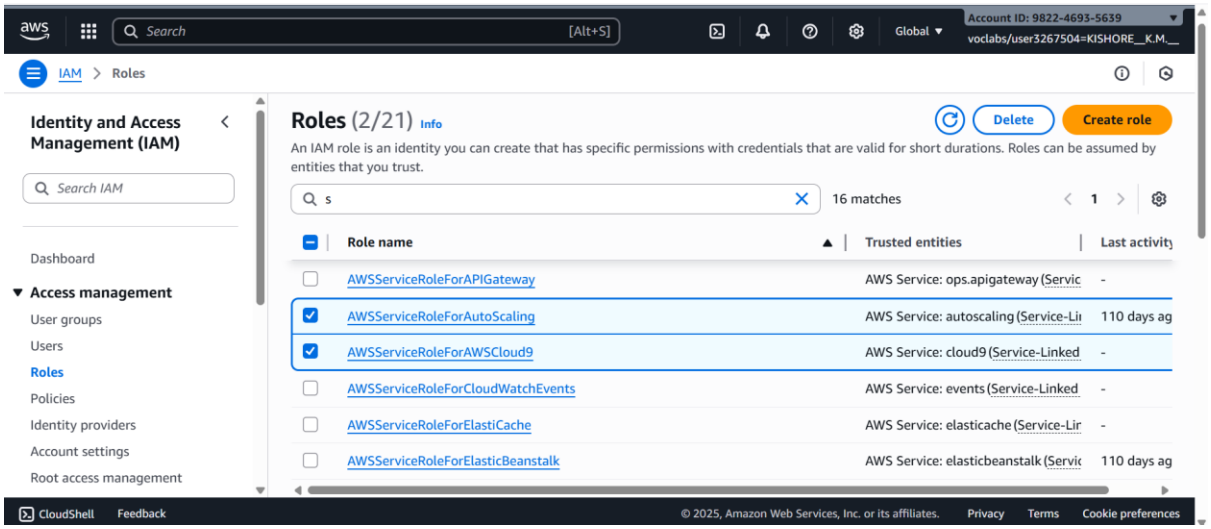
STEP 4 — Secure the Endpoints Using Token-Based Authentication

a) Description:

IAM policies, token-based authentication (JWT/API Keys), and role-based access control are applied to secure customer credential and payment endpoints.

b) Screenshot:




Search [Alt+S]
Global
Account ID: 9822-4693-5639
voclabs/user3267504=KISHORE__K.M.__
IAM > Roles
Identity and Access Management (IAM)
Search IAM
Dashboard
Access management
User groups
Users
Roles
Policies
Identity providers
Account settings
Root access management
Roles (2/21) 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.
Delete
Create role
s
16 matches
Role name
Trusted entities
Last activity
AWSServiceRoleForAPIGateway
AWS Service: ops.apigateway (Servic
AWSServiceRoleForAutoScaling
AWS Service: autoscaling (Service-Li
110 days ag
AWSServiceRoleForAWSCloud9
AWS Service: cloud9 (Service-Linked
AWSServiceRoleForCloudWatchEvents
AWS Service: events (Service-Linked
AWSServiceRoleForElastiCache
AWS Service: elasticache (Service-Lir
AWSServiceRoleForElasticBeanstalk
AWS Service: elasticbeanstalk (Servic
110 days ag
CloudShell
Feedback
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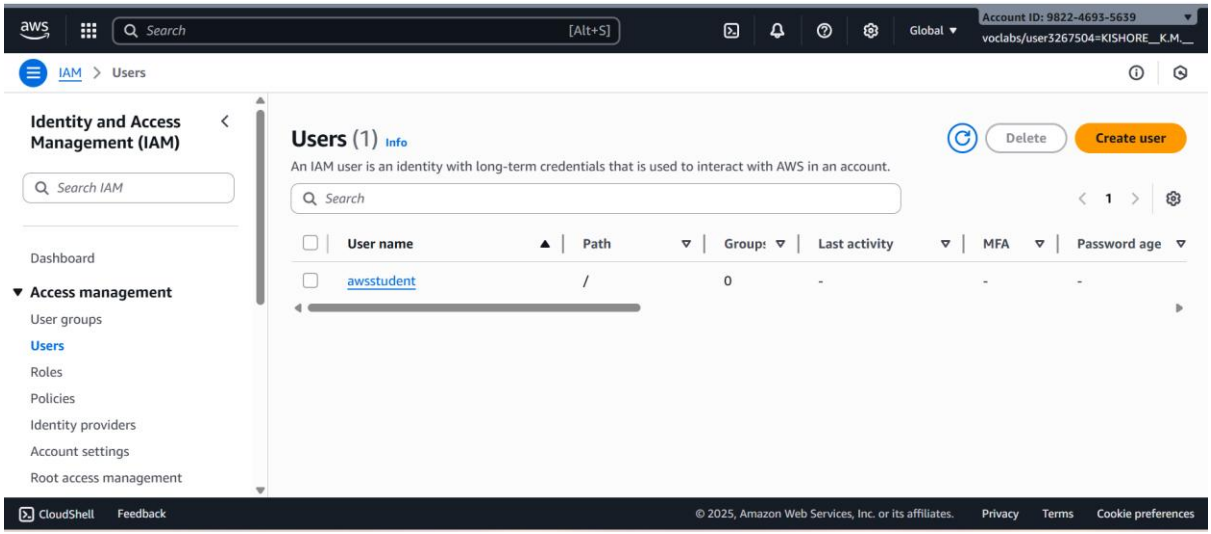
Search [Alt+S]
Global
Account ID: 9822-4693-5639
voclabs/user3267504=KISHORE__K.M.__
IAM > Users
Identity and Access Management (IAM)
Search IAM
Dashboard
Access management
User groups
Users
Roles
Policies
Identity providers
Account settings
Root access management
Users (1) Info
An IAM user is an identity with long-term credentials that is used to interact with AWS in an account.
Delete
Create user
Search
User name
Path
Groups
Last activity
MFA
Password age
awsstudent
/
0
CloudShell
Feedback
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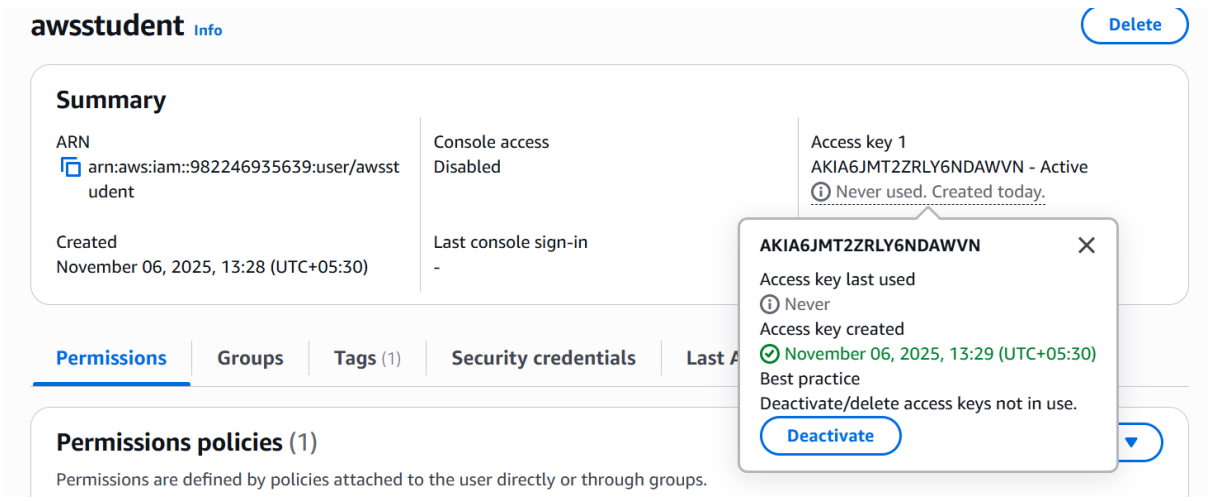
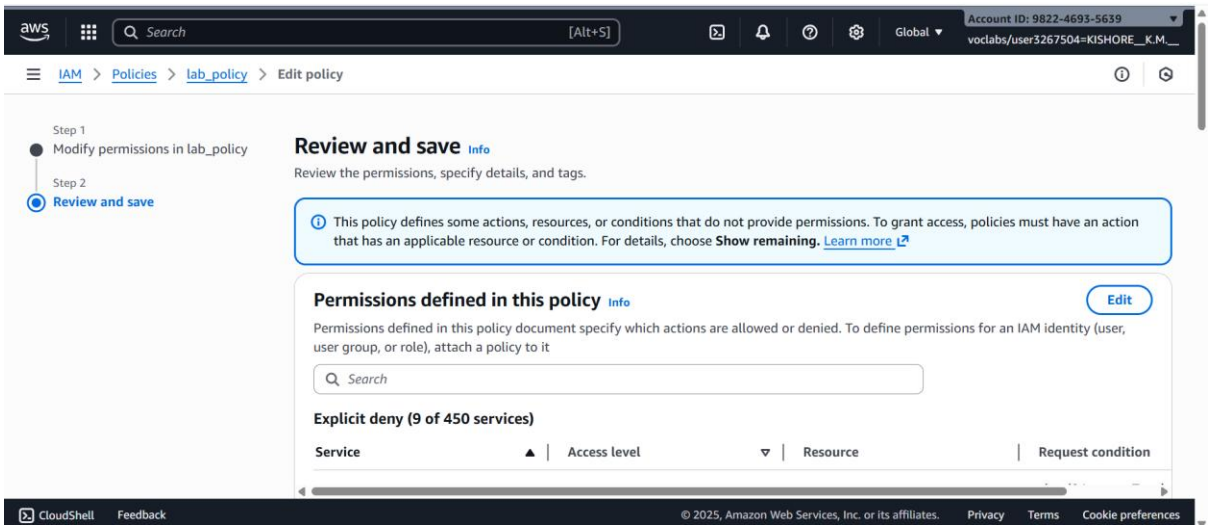

awsstudent Info
Delete
Summary
ARN
arn:aws:iam::982246935639:user/awsstudent
Console access
Disabled
Access key 1
AKIA6JMT2ZRLY6NDAWVN - Active
Never used. Created today.
Created
November 06, 2025, 13:28 (UTC+05:30)
Last console sign-in
-
AKIA6JMT2ZRLY6NDAWVN
Access key last used
Never
Access key created
November 06, 2025, 13:29 (UTC+05:30)
Best practice
Deactivate/delete access keys not in use.
Deactivate
Permissions
Groups
Tags (1)
Security credentials
Permissions policies (1)
Permissions are defined by policies attached to the user directly or through groups.



c) Caption:

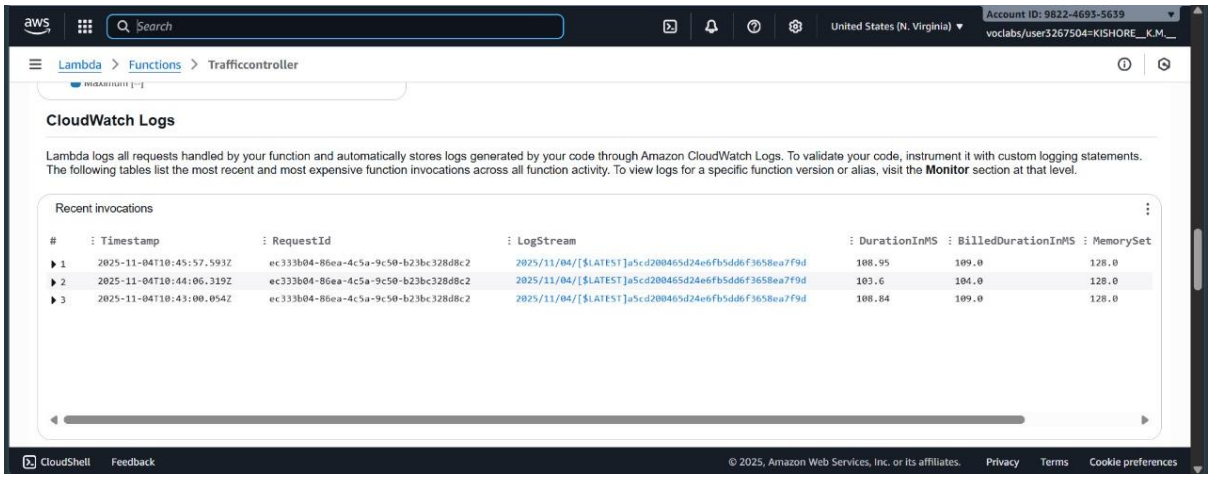
Token-based security applied to cloud endpoints.

STEP 5 — Connect Real-Time Dashboards via Cloud APIs

a) Description:

Dashboards are integrated using cloud APIs to monitor real-time login attempts, payment API usage, and security alerts.

b) Screenshot:



c) Caption:

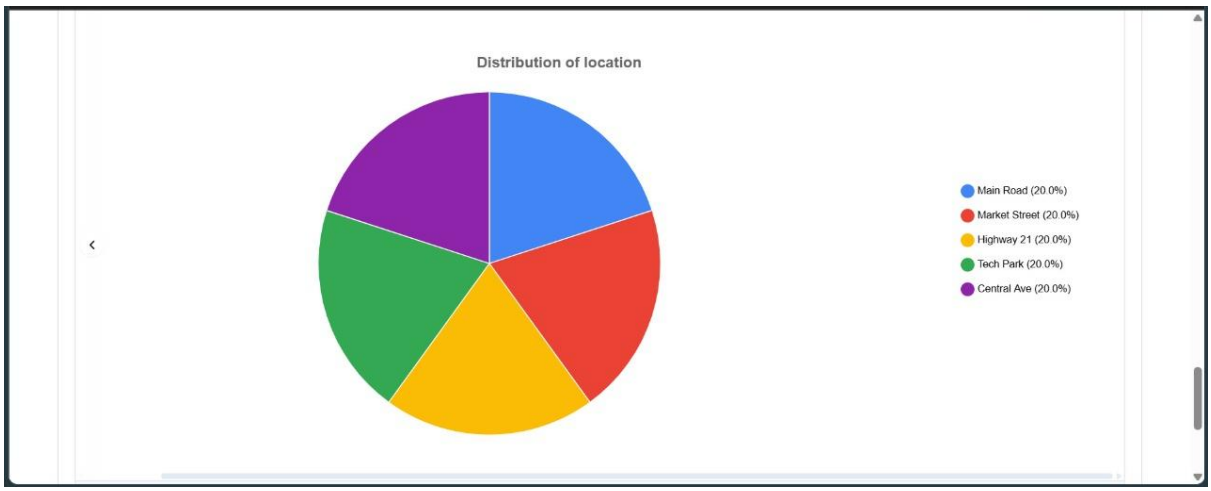
Real-time cloud dashboard displaying identity and payment activity.

STEP 6 — Perform Data Aggregation and Generate Daily Analytics Reports

a) Description:

The system aggregates access logs, risk predictions, and identity events to produce daily analytics reports for administrators.

b) Screenshot:



c) Caption:

Daily IAM analytics report generated in cloud dashboard.

CONCLUSION :

By following all steps aligned with cloud IAM principles, customer credentials and payment details are fully secured. Real-time monitoring, token-based access control, AI-driven threat detection, and continuous auditing provide layered protection against unauthorized access or fraud.