

Retail Banking System

Pod - 4

Members :

- 1) Mosami Bhagat
- 2) Kasturi Avvari
- 3) Thriveni Kukatla
- 4) Srineha Kalupu
- 5) Prerna Gupta

Mentor : Abraham Rohith Roy

Trainer : Gayathri Mahadevan

Coach : Nikanthrao Bhise
Kanchan

What are Microservices?

- Separating the different functionalities of a application into modules is called a microservice.
- In the simplest form, they help build an application as a suite of small services, each running in its own process and are independently deployable.
- Internal operations are a “black box”, accessible to external programs only via API.

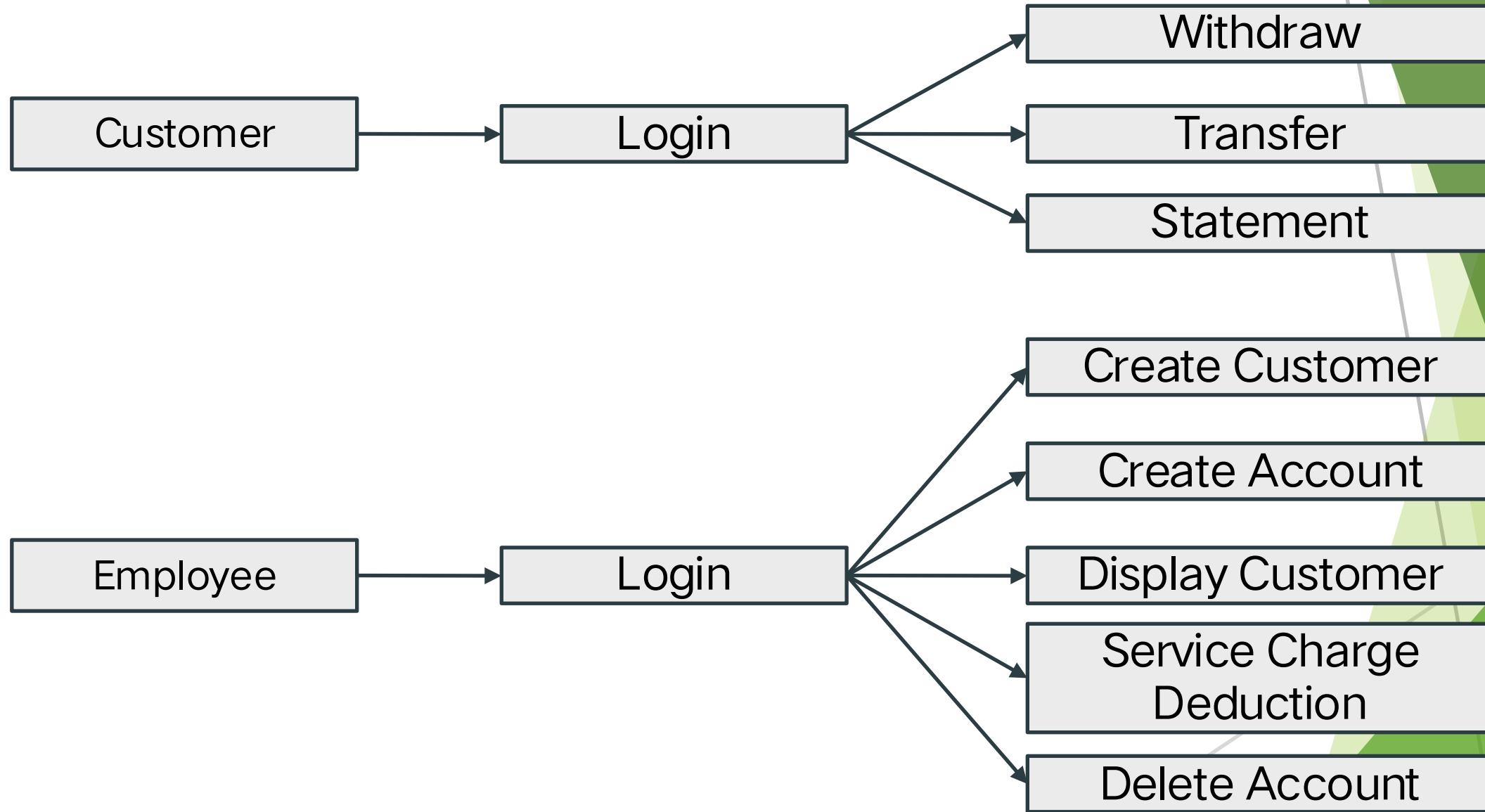
Why Microservice?

- Each service is independent from one another and can be developed in any language
- Can build Robust applications
- Microservices communicate with other microservices via Rest Api.
- Fault Tolerant Applications can be built .
- Each service can have it's own database. One module can have sql, another one can have mongoDB and so on.

Challenges in Microservice

- Testing can be complex.
- Requires devops culture.
- Large number of microservices places a overhead to keep track of them when the service is down.
- Up-front costs may be higher with microservices
- Debugging becomes more challenging with microservices.

Project Architecture :



Microservices Used

- Bank MVC
- Authorization
- Accounts
- Customer
- Rules
- Transactions

Bank MVC :

- This is the front-end of the Web Application. It houses all the JSP pages and redirects the requests to appropriate microservice.

Authorization Microservice :

- This service acts as a login authenticator for the application.
- JWT, is used as a authentication protocol for this application.

Accounts Microservice :

- This microservice handles the activities related to account, like creating account for a customer, deleting an account.
- Also, it uses the Rest API's from authentication microservice to validate the user accessing the resource and transaction, customer microservice.

Customer Microservice :

- This microservice provides services such as create customer, update customer, find customer details based on ID and delete customer.
- It also uses the Rest API's from authentication microservice to validate the user accessing the resource and account microservice to create the account for the customer

Rules Microservice :

- This microservice checks if the balance in every account is above the minimum value.
- It then deducts 10% of current balance as service charge if the above condition is not satisfied.

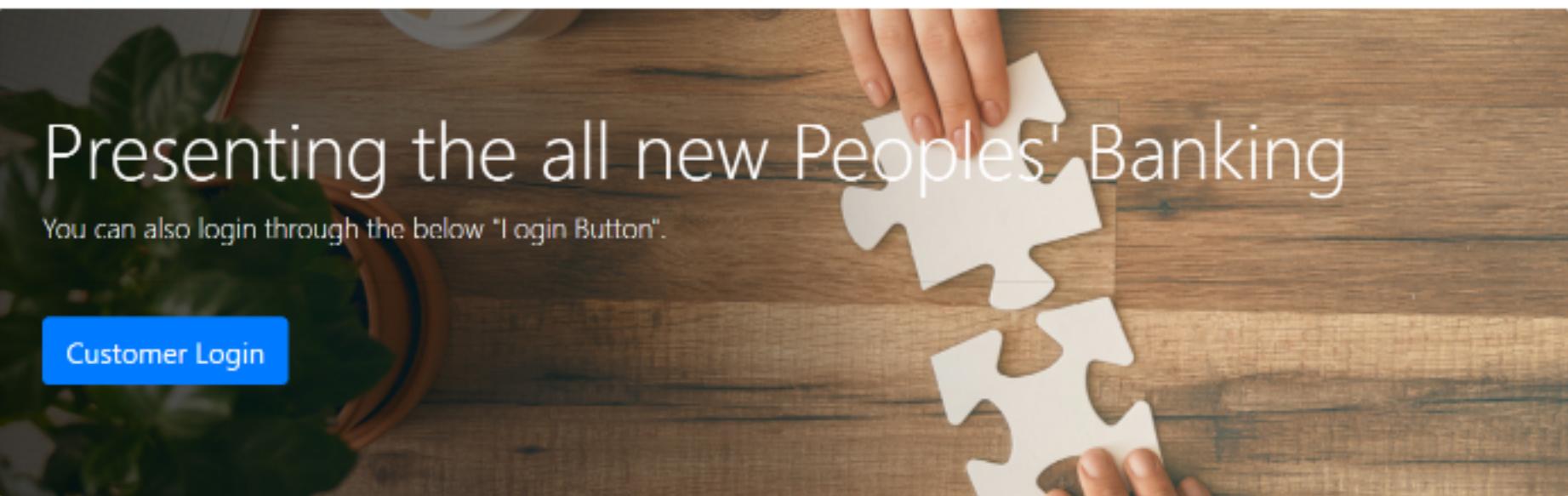
Transactions Microservice :

- This is responsible for performing all the transaction within the bank application like deposit, withdrawal and transfers.
- Transaction microservice is also used to deduct the service charges when invoked by account microservice.

Frontend Snapshots

Welcome to Peoples' Bank

It's simpler, smarter & more intuitive than ever.



[Customer Login](#)

Locate Us

You are never too far away from quick, efficient banking services. Locate your

Call Us

In case you wish to speak to our phone banking officer for urgent

Write to Us

Be it an enquiry, feedback or a simple suggestion, write to us & we'll get

Peoples' Bank

Sign In

UserId

password

Login

[Forgot password?](#)

[Don't have an account? Register here](#)

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Peoples Bank

Welcome to Peoples' Bank



Create Customer

Click the button to create the customer

Create or Update



Create Account for Customer

Customer ID:

Create Account



View the Customer

User ID:

View

Bar X | localhost | Swagg | Swagg | spring | {z} Spring | Talend | Spring | 18.138. | 18.138. | Spring | Spring | Spring | Mail | Sign in | +

localhost:8070/dashboard

Create Customer

Click the button to create the customer

Create or Update

Create Account for Customer

Customer ID: Enter the CustomerId

Create Account

View

User ID: Enter the UserId

VIEW THE CUSTOMER

This row contains three cards. The first card, titled 'Create Customer', has a dark gray header and footer. It features a central input field for 'Customer ID' and a blue 'Create Account' button. The second card, titled 'Create Account for Customer', has a light gray header and footer. It includes a text input for 'User ID' and a blue 'View' button. The third card, titled 'VIEW THE CUSTOMER', is identical in structure to the second.

Deposit Amount

Account ID: Enter the AccountId

Amount: Enter the amount

Deposit Amount

This card features a large image of a hand holding a yellow credit card above a grey payment terminal. Below the image, the title 'Deposit Amount' is displayed, followed by two input fields for 'Account ID' and 'Amount'. A blue 'Deposit Amount' button is at the bottom.

Service Charge Deduction

Charges will be deducted for not maintaining minimum balance

Deduct

This card features a large image of a hand holding a yellow credit card above a grey payment terminal. Below the image, the title 'Service Charge Deduction' is displayed, followed by a descriptive message about minimum balance and a blue 'Deduct' button. The overall design is consistent with the other cards in the row.

Peoples' Bank

Home

Customer Creation!!

Enter Customer ID	108
Enter Username	Username
Enter Password	*****
Enter Date Of Birth	01/07/1998
Enter PAN Number	EHMPM4438H
Enter Present Address	pune
<input checked="" type="checkbox"/> I Accept all Terms and Conditions*	

Peoples' Bank

[Sign In](#)

CUSTOMER101

Login

[Forgot password?](#)

[Don't have an account? Register here](#)

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Customer Details

CUSTOMER ID	CUSTOMER NAME	DOB	PAN	ADDRESS	ACCOUNTS			
CUSTOMER101	Shiva	1999-02-01	ABCDE1234A	Bangalore India	ACCOUNT ID	CURRENT BALANCE	ACCOUNT TYPE	OWNER NAME
					1000000001	1000.0	Savings	Shiva

Transaction Details

1000000001

sourceAccountId	sourceOwnerName	targetAccountId	targetOwnerName	amount	initiationDate	reference
1000000001	Shiva	1000000002	Siddharth	100.0	2021-08-01T10:30	transfer

localhost:8070/customerdashboard/getTransactionsInCustomerdashboard

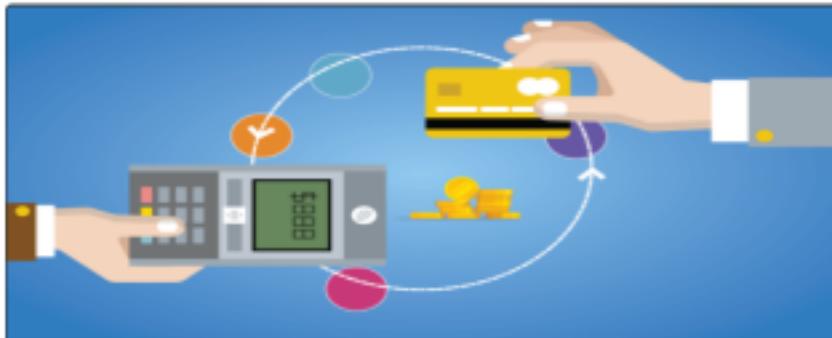


Withdraw Amount

From Account:

Enter the Amount to Withdraw:

Withdraw Amount



Transfer Amount

From Account:

Enter the Target Account No:

Enter the Amount to Transfer:

Transfer Amount

Bank S | Swg | Swagg | spring | {z} Spring | Talend | Spring | 18.138. | 18.138. | Spring | Spring | Spring | Mail | Sign in | +

← → C ① localhost:8085/customer/swagger-ui.html#/customer-controller

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swagger Select a spec default

Customer Service API

[Base URL: localhost:8085/customer]
<http://localhost:8085/customer/v2/api-docs>

Retail Banking Project

[Terms of service](#)

[Contact Peoples' Bank](#)

[License of API](#)

customer-controller Customer Controller

GET /check checkAccessWWithoutValidation

POST /createCustomer createCustomer

DELETE /deleteCustomer/{id} deleteCustomer

GET /getCustomerDetails/{id} getCustomerDetails

POST /saveCustomer saveCustomer

POST /updateCustomer updateCustomer

AWS Snapshots

Amazon S3



Amazon S3 > retailbank



Buckets

Access Points

Object Lambda Access Points

Multi-Region Access Points

Batch Operations

Access analyzer for S3

Block Public Access settings for this account

▼ Storage Lens

Dashboards

AWS Organizations settings

Feature spotlight (3)

▶ AWS Marketplace for S3

retailbank Info

Publicly accessible

Objects

Properties

Permissions

Metrics

Management

Access Points

Objects (6)

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](#)

C Copy S3 URI Copy URL Download Open Delete Actions Create folder UploadFind objects by prefix < 1 > ①

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	account-service.jar	jar	March 12, 2022, 12:29:06 (UTC+05:30)	54.3 MB	Standard
<input type="checkbox"/>	Authentication-MS-0.0.1-SNAPSHOT.jar	jar	March 11, 2022, 18:07:25 (UTC+05:30)	42.1 MB	Standard
<input type="checkbox"/>	bankmvc-0.0.1-SNAPSHOT.jar	jar	March 12, 2022, 12:09:05 (UTC+05:30)	49.0 MB	Standard
<input type="checkbox"/>	CustomerService-0.0.1-SNAPSHOT.jar	jar	March 12, 2022, 12:37:50 (UTC+05:30)	55.4 MB	Standard
<input type="checkbox"/>	rules-service.jar	jar	March 12, 2022, 12:37:50 (UTC+05:30)	69.4 MB	Standard
<input type="checkbox"/>	transactionservice-0.0.1-SNAPSHOT.jar	jar	March 12, 2022, 12:37:50 (UTC+05:30)	59.1 MB	Standard



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Amazon S3



Edit

Buckets

Access Points

Object Lambda Access Points

Multi-Region Access Points

Batch Operations

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Block Public Access settings for this account

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Dashboards

AWS Organizations settings

Feature spotlight 3

▶ AWS Marketplace for S3

Block off public access



► Individual Block Public Access settings for this bucket

Bucket policyThe bucket policy, written in JSON, provides access to the objects stored in the bucket. Bucket policies don't apply to objects owned by other accounts. [Learn more](#)

Edit

Delete

Copy

```
{  
  "Version": "2012-10-17",  
  "Statement": [  
    {  
      "Sid": "PublicReadGetObject",  
      "Effect": "Allow",  
      "Principal": "",  
      "Action": "s3:GetObject",  
      "Resource": [  
        "arn:aws:s3:::retailbank/Authentication-MS-0.0.1-SNAPSHOT.jar",  
        "arn:aws:s3:::retailbank/bankmvc-0.0.1-SNAPSHOT.jar",  
        "arn:aws:s3:::retailbank/account-service.jar",  
        "arn:aws:s3:::retailbank/*"  
      ]  
    }  
  ]  
}
```

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S3

Amazon S3

Buckets

Access Points

Object Lambda Access Points

Multi-Region Access Points

Batch Operations

Access analyzer for S3

Block Public Access settings for this account

Storage Lens

Dashboards

AWS Organizations settings

Feature spotlight 3

AWS Marketplace for S3

Amazon S3

Account snapshot

Last updated: Mar 11, 2022 by Storage Lens. Metrics are generated every 24 hours. Learn more ⓘ

Total storage 6.6 GB **Object count** 1.3 k **Avg. object size** 5.4 MB You can enable advanced metrics in the "default-account-dashboard" configuration.

Buckets (94) Info

Buckets are containers for data stored in S3. Learn more ⓘ

retail

1 match

< 1 > ⌂

Name	AWS Region	Access	Creation date
retailbank	Asia Pacific (Singapore) ap-southeast-1	Public	March 11, 2022, 18:06:22 (UTC+05:30)

View Storage Lens dashboard

Amazon S3



Amazon S3 > retailbank > account-service.jar

account-service.jar Info Copy S3 URI Download Open Object actions ▾

Buckets

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Feature spotlight 3

▶ AWS Marketplace for S3

Properties

Permissions

Versions

Object overview

Owner

cloudkarvan6

AWS Region

Asia Pacific (Singapore) ap-southeast-1

Last modified

March 12, 2022, 12:29:06 (UTC+05:30)

Size

54.3 MB

Type

jar

Key

 account-service.jar

S3 URI

 s3://retailbank/account-service.jar

Amazon Resource Name (ARN)

 arn:aws:s3:::retailbank/account-service.jar

Entity tag (Etag)

 934f3410800b2d66dc6fb07e2a068e2-4

Object URL

 <https://retailbank.s3.ap-southeast-1.amazonaws.com/account-service.jar>

Object management overview

The following bucket properties and object management configurations impact the behavior of this object.

Be.Cognizant EC2 Global View Instance details | EC2 Management

ap-southeast-1.console.aws.amazon.com/ec2/home?region=ap-southeast-1#InstanceDetails:instanceId=i-0eb44f7bea0ce49c0

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EC2 Dashboard EC2 Global View Events Tags Limits Instances Instances New Instance Types Launch Templates Spot Requests Savings Plans Reserved Instances New Dedicated Hosts Capacity Reservations Images AMIs New AMI Catalog Elastic Block Store Volumes New Feedback English (US) ▾

Instance summary for i-0eb44f7bea0ce49c0 (RetailBanking) Info Updated less than a minute ago

C Connect Instance state Actions

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0eb44f7bea0ce49c0 (RetailBanking)	18.138.106.165 open address	172.31.17.177
IPv6 address	Instance state	Public IPv4 DNS
-	Running	ec2-18-138-106-165.ap-southeast-1.compute.amazonaws.com open address
Hostname type	Private IP DNS name (IPv4 only)	Answer private resource DNS name
IP name: ip-172-31-17-177.ap-southeast-1.compute.internal	ip-172-31-17-177.ap-southeast-1.compute.internal	IPv4 (A)
Instance type	Elastic IP addresses	VPC ID
t2.micro	18.138.106.165 (RetailBankingElasticIP) [Public IP]	vpc-04c58922a74aadb0a
AWS Compute Optimizer finding	IAM Role	Subnet ID
① Opt-in to AWS Compute Optimizer for recommendations. Learn more	-	subnet-023e92897c31394ad

Details Security Networking Storage Status checks Monitoring Tags

▶ Instance details Info

▼ Host and placement group Info

Host ID	Affinity	Placement group
-	-	-

Activate Windows Go to Settings to activate Windows.

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7:48 PM 26°C Clear 3/12/2022

i-0eb41f7bee0ce18d0 (RetailBanking)

Actions Windows

i-0eb44f73ee0ce18c0 (RetailBanking)

[Windows](#)

API-PORT	FROM-APPNAME	AUTH-TOKEN	PASSWORD	PROT-IP	LOG-INNAME
EMPLOYEE-101	new	admin@emp-101	Emp123@123	192.168.1.101	admin
CUSTOMER-102	new	customer@102	Customer@123	192.168.1.102	customer
CUSTOMER-103	new	customer@103	Customer@123	192.168.1.103	customer
CUSTOMER-104	new	customer@104	Customer@123	192.168.1.104	customer

1

[Activate Windows](#)

1-Deb447Thea0ea46e0 (Rate Banking)

Phase 4: Retail Banking

NAME	LAST NAME	ADDRESS	PHONE	EMAIL	NOTES
John	Doe	123 Main Street	555-1234	john.doe@example.com	
Jane	Doe	456 Elm Street	555-2345	jane.doe@example.com	Needs a haircut.
Bob	Brown	789 Oak Street	555-3456	bob.brown@example.com	

Customer ID	Customer Name	Address	City	State	Zip	Phone	Fax
100000001	John Doe	123 Main St	Anytown	CA	90210	(555) 555-1234	(555) 555-1235
100000002	Susan Smith	456 Elm St	Anytown	CA	90210	(555) 555-1236	(555) 555-1237

The background features a large, abstract graphic on the left side composed of dark blue, green, and grey triangles. A thin white line runs diagonally from the bottom-left corner towards the center.

▶ Thank you