Simulate Distributed IPAM

Overview:

In this assignment, I will leverage a queue service to provide IP addresses in a client/server architecture. Leverage Amazon SQS to return the most recently available IP address.

Technology:

Language: Java

Develop Tool: Intellij IDEA

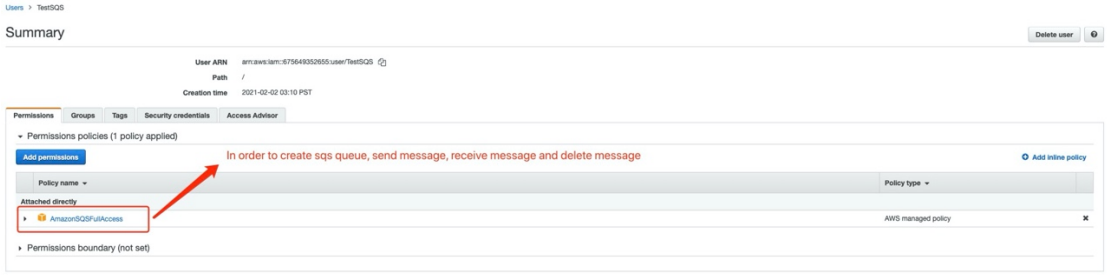
Build Tool: Apache maven

Cloud Service: AWS SQS

Implement:

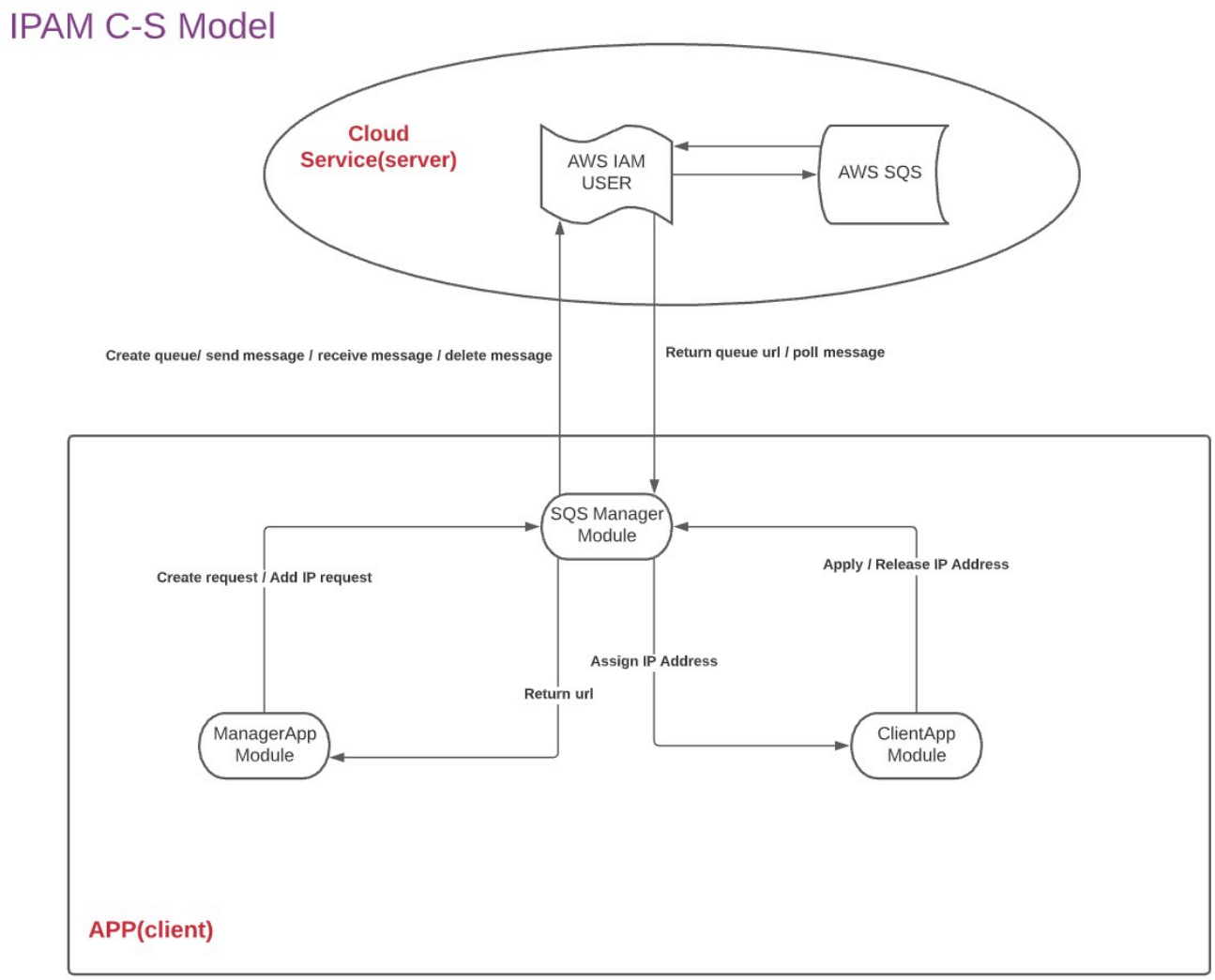
1. Create an AWS account
2. Create an IAM user (TestSQS)

3. Set permissions (AmazonSQSFullAccess)

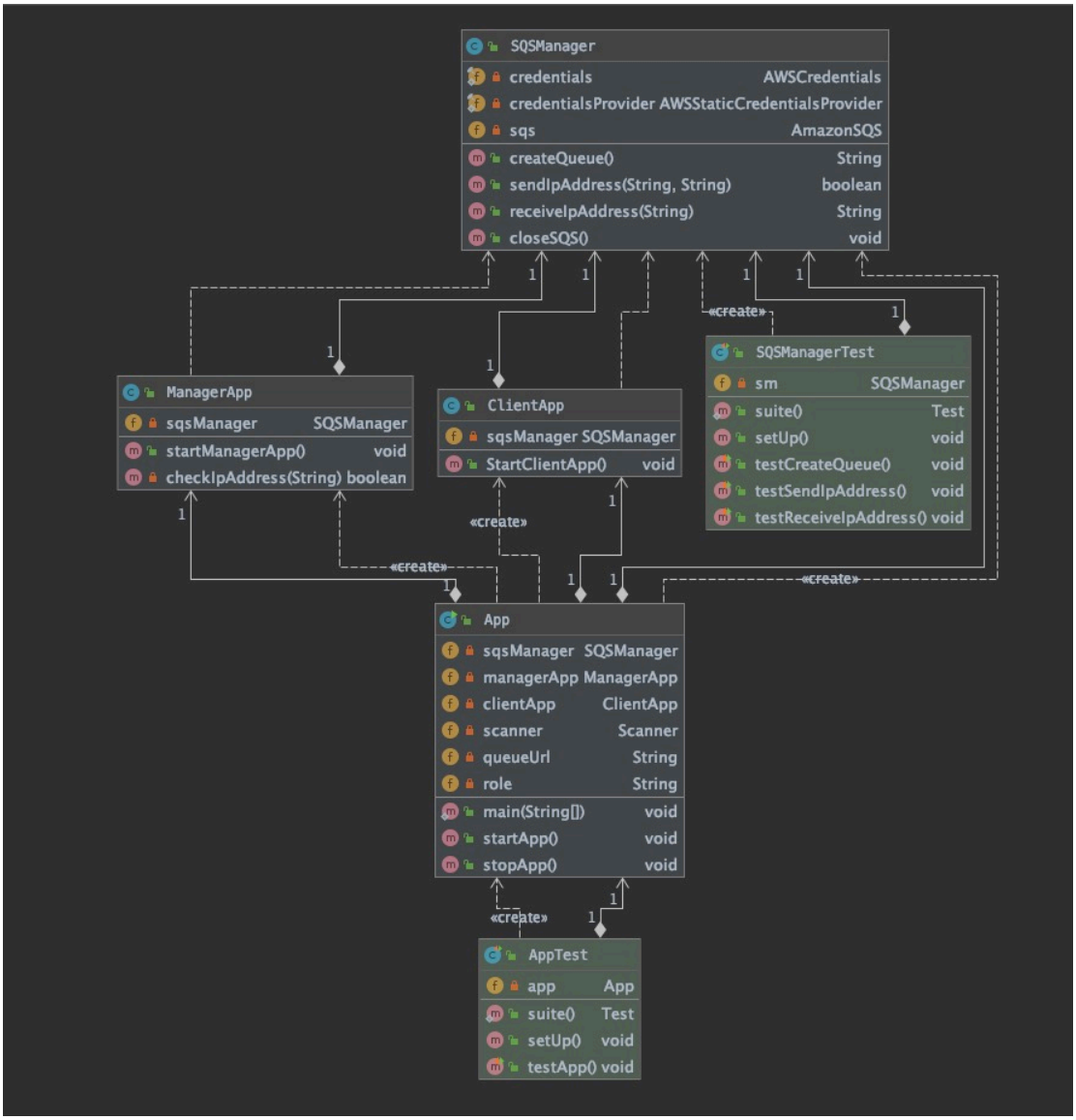


4. Get the Access Key ID and the Secret Access Key
5. Configure credentials (In order to Ensure the cloud service are easy to access, I save the credentials in the application)
6. Start to develop the application.
7. Build a new class called “SQSManager” which is used to communicate with AWS sqs service. The class supports to build Amazon sqs client, create sqs queue, send message, receive message, delete message and close connection.
8. Build a new class called “App” and create an instance of “SQSManager”.
9. Build a new class called “ManagerApp”. By calling “SQSManager” functions, this class can be used to create sqs queue and add IP address.
10. Build a new class called “ClientApp”. By calling “SQSManager” functions, this class can be used to apply IP address and release IP address.

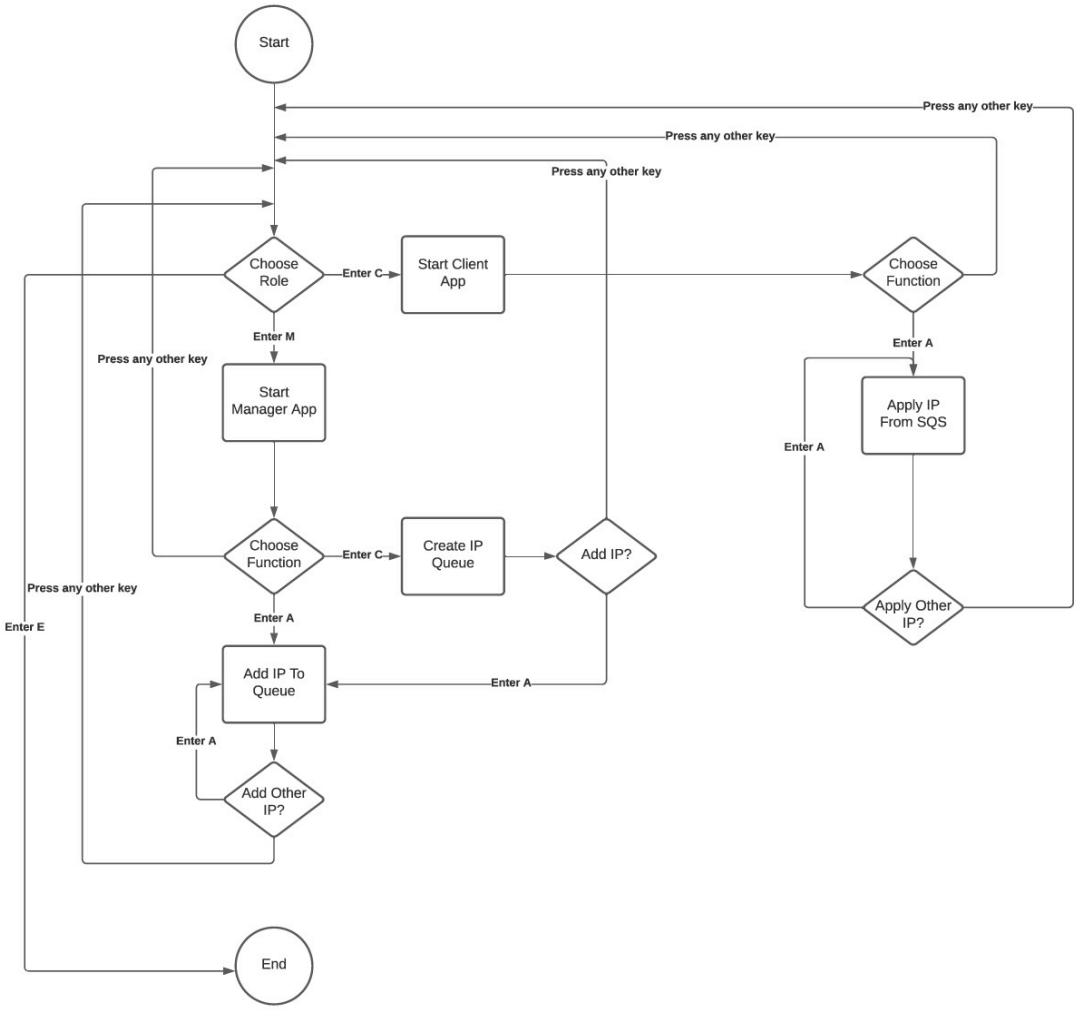
Architecture:



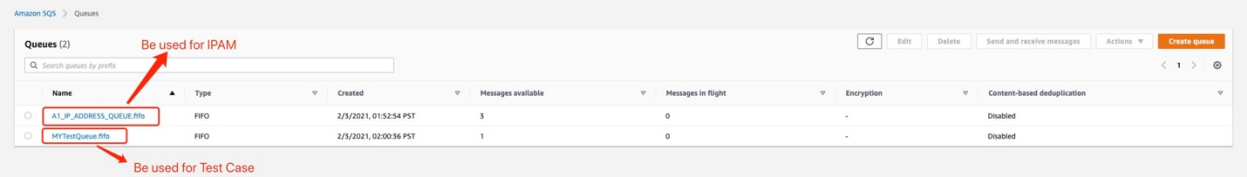
UML:

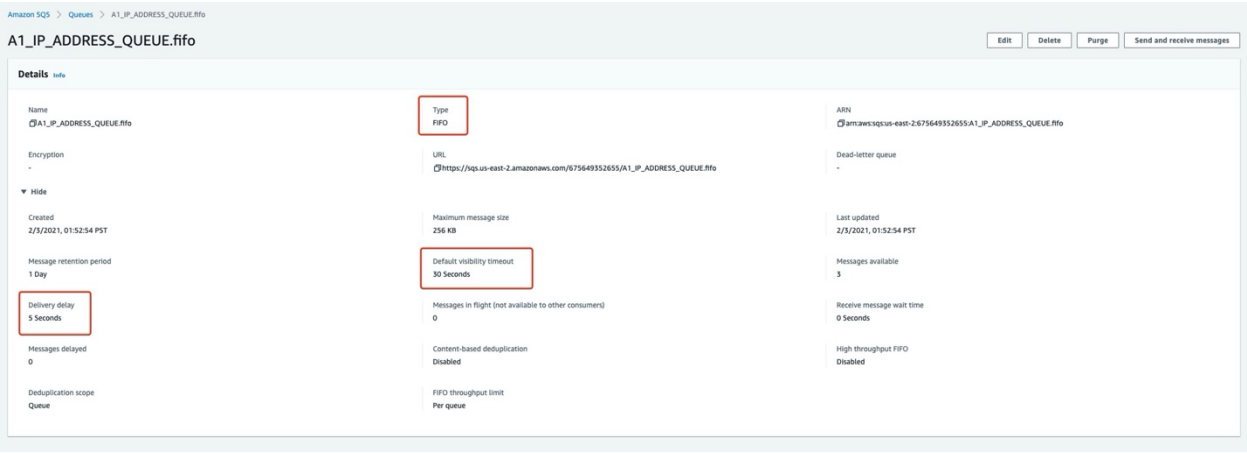

SQSManager
credentials AWSCredentials
credentialsProvider AWSStaticCredentialsProvider
sqs AmazonSQS
createQueue() String
sendIpAddress(String, String) boolean
receiveIpAddress(String) String
closeSQS() void
ManagerApp
sqsManager SQSManager
startManagerApp() void
checkIpAddress(String) boolean
ClientApp
sqsManager SQSManager
StartClientApp() void
SQSManagerTest
sm SQSManager
suite() Test
setUp() void
testCreateQueue() void
testSendIpAddress() void
testReceiveIpAddress() void
App
sqsManager SQSManager
managerApp ManagerApp
clientApp ClientApp
scanner Scanner
queueUrl String
role String
main(String[]) void
startApp() void
stopApp() void
AppTest
app App
suite() Test
setUp() void
testApp() void
«create»

Workflow:

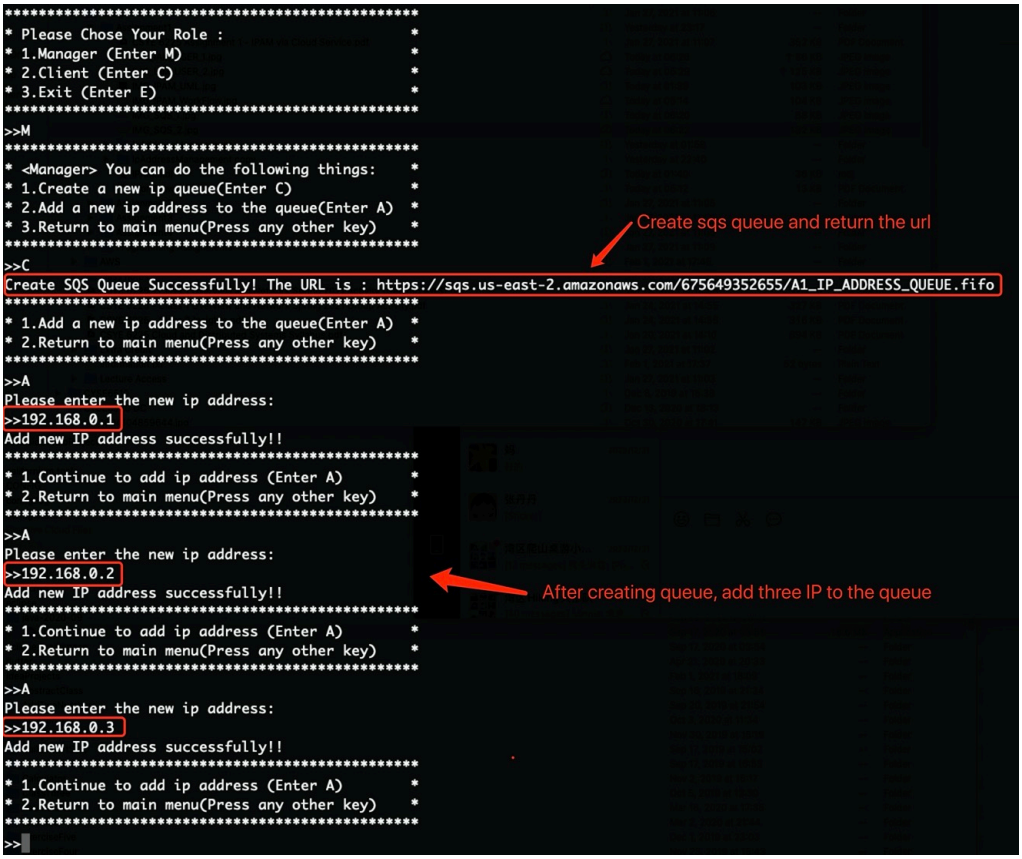

Start
Press any other key
Press any other key
Press any other key
Choose Role
Enter C
Start Client App
Choose Function
Enter M
Enter A
Press any other key
Start Manager App
Apply IP From SQS
Enter A
Choose Function
Enter C
Create IP Queue
Add IP?
Press any other key
Apply Other IP?
Enter A
Enter E
Add IP To Queue
Enter A
Enter A
Add Other IP?
End

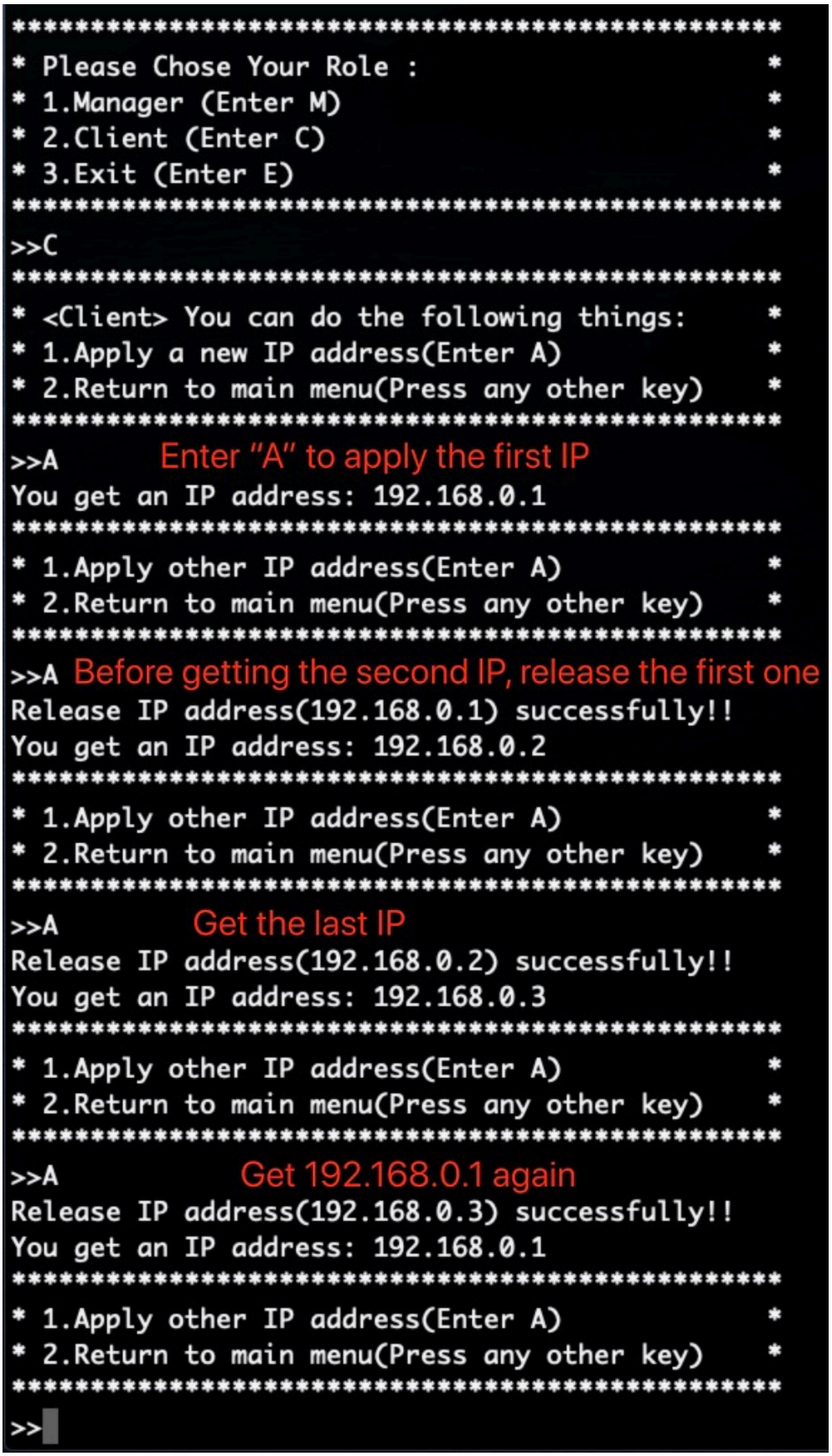
SQS:





Running Result:




****
* Please Chose Your Role :
* 1.Manager (Enter M)
* 2.Client (Enter C)
* 3.Exit (Enter E)
****
>>C
****
* <Client> You can do the following things:
* 1.Apply a new IP address(Enter A)
* 2.Return to main menu(Press any other key)
****
>>A
Enter "A" to apply the first IP
You get an IP address: 192.168.0.1
****
* 1.Apply other IP address(Enter A)
* 2.Return to main menu(Press any other key)
****
>>A
Before getting the second IP, release the first one
Release IP address(192.168.0.1) successfully!!
You get an IP address: 192.168.0.2
****
* 1.Apply other IP address(Enter A)
* 2.Return to main menu(Press any other key)
****
>>A
Get the last IP
Release IP address(192.168.0.2) successfully!!
You get an IP address: 192.168.0.3
****
* 1.Apply other IP address(Enter A)
* 2.Return to main menu(Press any other key)
****
>>A
Get 192.168.0.1 again
Release IP address(192.168.0.3) successfully!!
You get an IP address: 192.168.0.1
****
* 1.Apply other IP address(Enter A)
* 2.Return to main menu(Press any other key)
****
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