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**Institute of Information and communication Technology**

**IT628 Systems Programming Winter 2020-21**

**Payment Gateway**

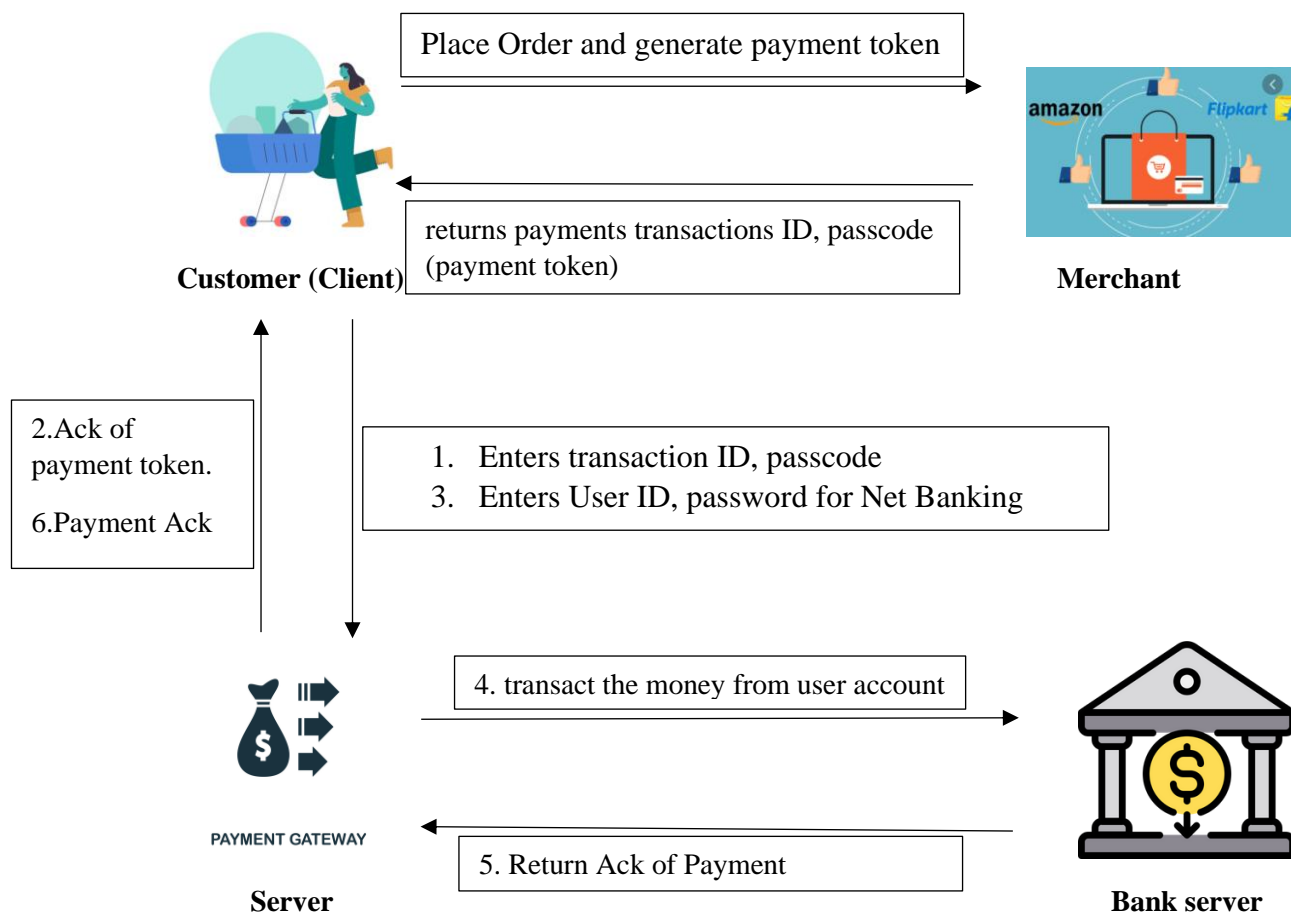
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## Goal of the project:

A payment gateway is a Third-Party merchant-based payment service where direct payments processing for e-businesses, online retailers etc... can be done. The payment gateway here does the third-party payments in which the gateway itself directly contact with the bank server for the payment regarding the third-party bills.



1. User (client) enters transaction ID, Passcode of the payment token generated from other third-party websites (e.g., e-commerce).
2. Acknowledgement from payment gateway whether the payment token is valid or not.
3. If the payment ack is true then user need to enter User Id, password for the net banking.
4. Transact the money from the user specified user Id (account) by bank server.
5. Return ack of payment from the bank server to the payment gateway.
6. Final Payment ack from payment gateway to customer.

**Requirements:**

- Customers can pay their Third-party payments from the payment gateway server.
- Payment Gateway will check the Payment Token Details provided by Client (Customer).
- After that Payment Gateway will return ack of Payment already done if it is paid earlier otherwise, we will take the input of user Id and Password from the client.
- Payment Gateway should not know the user id and password of the client.
- So, that we have to encode it and then transfer that Encoded info to the Payment Gateway server, later on the payment gateway server will transfer the user id and password to the Citi bank server for the amount to be paid according to the transaction which is provided by the client earlier.
- Citibank should Decode the User Id and Password.
- Now, the Citi bank server will check the amount availability, if the balance amount in the account is more than the amount to be paid then the payment of that transaction should be done. Otherwise, the Payment failed message will be given to the Payment server, and that payment server will give that info to the Client.
- We need to implement the session timeout in the client side, if the payment is not done within the 30 seconds, then Session timeout will occur for particular transaction.
- In between all the signals in the client and payment gateway server should be blocked.
- Encryption and decryption of the password and user ID should be done.
- Transaction of the Amount from Customer account to Merchant account should be done.
- If the payment is done then the Payment Token should be updated to paid.
- Bank should register Each transaction with Unique Transaction Record and the UTR number will be forwarded to the customer for future references.
- Payment Gateway Server should Record each of the client activity (which includes Connected time with which IP address and port, similarly the Disconnected time).

**Assumption:**

Customer already placed an order and generated the payment Token (which includes Transaction ID and Passcode) on the merchant side.

Merchant will share the payment tokens with the payment gateway server (Company).

Payment gateway will have payment token in the file called PaymentTokensData.txt file. Which includes (Transaction Id, passcode, paid/unpaid, amount-to-be-paid).

Bank server will have file of Net banking details of each user in file called NetbankingUsers.txt file. Which include (Customer ID, user ID, password, Amount-Available).

**Topics Covered in project:**

- -Thread

- Gateway Server
  - Client Server
  - Bank Server
- -Networking
  - Bank - server running on (localhost 15001)
  - Payment Gateway – Server running on (localhost 15000)
  - Client – Client running on (Localhost, Ephemeral Port)
- -Signals
  - Payment Gateway – Ignoring all the signal here
  - Client – Ignore SIGINT, Session for 30 seconds using SIGALRM
- -Files IO (UNBUFFERED)
  - Citibank Server
    - Merchant.txt
    - TransactionID.txt
    - NetBankingUser.txt
  - Gateway Server
    - GatewayTransaction.txt
    - PaymentTokensData.txt
    - LogFiles.txt
- -Shell Script
  - -encode
  - -decode
- -Makefile
- Shared Library for ClientFD and ListenFD
  - ClientFD
    - GatewayClient to connect with Gatewayserver
    - Gatewayserver to connect with CitiBankserver
  - ListenFD
    - Gatewayserver to connect with Clients
    - CitiBankserver to connect with Gatewayserver
- -PIPES && Process Management
  - Using excepc() pass data to child to parent in ENCODE and DECODE