E-payment Gateway Model

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Abstract—The extraordinary growth of interconnected computer network & pervasive trends of using this network as new field for conducting Business process are stimulating the demand for new payment methods. These new methods attain high level of security, speed, privacy, decentralization & internationalization. This seminar surveys the state of art in payment technology & we proposed model for electronic payment gateway, On the basis of requirement of electronic payment gateway. E-payment is now one of most central research areas in E-commerce. E-payment system the automated process of exchanging monetary values among parties in business transactions. In this paper a brief overview of electronic payment gateway is provided. This, addresses the requirements for an electronic payment gateway from both the customers and the merchants' point of view. Most of the population doesn't trust on the local existing online payment gateway because it is not very secure. Mostly people want to adopt electronic payment system as it has lots of advantages. They need such a gateway that fulfil their all requirements and provide security, privacy etc. On the basis of these requirements and the local infrastructure, we propose an electronic payment gateway for local environment..

Keywords— E-payment, Gateway

I. INTRODUCTION

The Gateway is called as Trusted Third Party or Entry point to any network. Used in E-commerce system for more secure transaction. Online shopping allows customers to sit in their homes and buy goods from all over the world. Similarly allow Merchant to sell their products to all over the world from home. Most of the population will use online payment in near future. Most of the Third world (Developing & undeveloped) countries lagged behind in making a good Internet architecture. There is need of a secure online payment gateway in developing countries. It also mentioned the requirement for an electronic payment gateway from customer and merchant's point of view. And on the basis of these facts and figures a new secure e-payment gateway has been designed and developed. The payment gateway would provide secure transactions. On the basis of proposed architecture of e-payment system of third world countries and the requirements related to any electronic payment gateway, we design and develop a Secure, reliable and efficient electronic payment gateway. Electronic payment systems securely process such payments and can be implemented by merchants themselves on their own web servers or alternatively, they can be provided to merchants by third party e-payment service providers. This seminar report describes the mode of operation of a broad range of e-payment systems available today in order to provide a comparative evaluation of their advantages and disadvantages.

The analysis is presented in terms of the features of each system and discusses the advantages and disadvantages to the customer, the merchant, the e-payment service provider and the financial institution. The Common E-payment include the payment cards (credit or debit),ATM (automated teller machines) etc. Use in E-business framework for additional secure transaction. Web shopping permits clients to sit in their homes and purchase merchandise from everywhere throughout the planet. Additionally permit Merchant to offer their items to everywhere throughout the planet from home. The greater part of the populace will utilize on-line instalment as a part of not so distant future. A large portion of the Third planet nations lingered behind in making a great Internet construction modelling. There is need of a protected on-line instalment passage in advancing nations. On the premise of proposed structural engineering of e-instalment arrangement of underdeveloped nations, this seminar report gives a short review of existing electronic instalment entryway. It likewise said the prerequisite for an electronic instalment portal from client and dealer's perspective. What's more on the foundation of these statistical data points another secure e-instalment entryway has been composed and advanced. The instalment passage might furnish secure transactions .On the foundation of proposed structural engineering of epayment arrangement of underdeveloped nations and the prerequisites identified with any electronic instalment portal, we outline and advance a Secure, solid and proficient electronic instalment portal.

Secure Pay furnishes an instalment door that expedites electronic trade by empowering vendors to acknowledge Visas and electronic checks as techniques for instalment for merchandise and administrations sold on the web. The entryway gesture as a scaffold between the vendor's site and the fiscal organizations that process instalment transactions. Instalment information is gathered online from the customer and submitted to the passage for continuous commission. Not with standing, the instalment entryway is focused on towards shippers that process Card-Not-Present transactions. In a Card-Not-Present transaction, the shipper and the customer are not in the same physical area and the client as a rule brings in the instalment information or keys in the portions of the MasterCard on a site. All e-trade and mail/telephone requests are Card-Not-Present transactions.

II. PRELIMINARIES

Online customer: A customer is an entity who will buy products by making payments in timely manner.
Merchants: A merchant is a seller who will receive payments made by customer.
Banks: Two banks are involved
   1. Client bank
   2. Merchant bank
Client bank: Client bank holds client's bank account and validate customer during account registration. Merchant bank: Merchant bank holds merchant bank account. It is responsible of management, fraud control etc. A merchant account is a type of bank account that allows businesses to accept payments by payment cards, typically debit or credit cards. A merchant account is established under an agreement between an acceptor and a merchant acquiring bank for the settlement of payment card transactions.
Payment Gateway: A payment gateway is connected to all customers, merchants and banks through Internet and responsible for the speed and reliability and security of all transactions that take place. A payment gateway is an e-commerce service that authorizes payments for e-businesses and online retailers. It is the equivalent of a physical POS (point-of-sale) terminal located in most retail outlets. A merchant account provider is typically a separate company from the payment gateway. Some merchant account providers have their own payment gateways but the majority of companies use 3rd party payment gateways.

The gateway usually has 2 components:

a) The virtual terminal that can allow for a merchant to securely login and key in credit card numbers ,

b) Have the website's shopping-cart connect to the gateway via an API to allow for real time processing from the merchant's website.

In existing system we use electronic gateway which is used for secure transactions between client and merchant. If new user wants to do transaction then he/she should register Himself/herself first through registration form then browse merchant website using e-payment gateway. Select item and encrypt payment request and send it to Server. Server receives encrypted message from sender, decrypt message, read, encrypt it using its own keys and send it to Client bank. Client bank transfers the required amount to the merchant bank through secure network. After receiving the fund Merchant bank sends the payment.

There are five interfaces.
1. Customer Interface
2. Server (e-payment Gateway) Interface
3. Client Bank Interface
4. Merchant Bank Interface
5. Merchant Interface
Online Customer will connect to e-payment gateway through Internet. Gateway will connect to the Bank and check whether its bank accounts are enough to buy the required product. Online customer can also visit Merchant's website through Gateway. Secure Pay provides a payment gateway that facilitates electronic commerce by enabling merchants to accept credit cards and electronic checks as methods of payment for goods and services sold online. The gateway acts as a bridge between the merchant's website

and the financial institutions that process payment transactions. Payment data is collected online from the shopper and submitted to the gateway for real-time authorization. However, the payment gateway is targeted towards merchants that process Card-Not-Present transactions. In a Card-Not-Present We proposed a model of electronic payment gateway on the basis of requirements of an electronic payment gateway in developing countries transaction, the merchant and the shopper are not in the same physical location and the customer usually calls in the payment data or keys in the details of the credit card on a website. All e-commerce and mail/telephone orders are Card-Not-Present transactions.
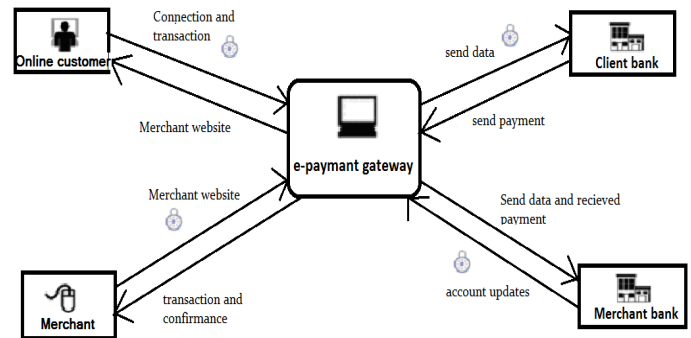

Fig. 1 Proposed Gateway Network

III. OBJECTIVES

All Our aim is to Design & Implementation of Transaction Gateway Server for E-commerce payment system with technology with packet security. The Gateway is called as Trusted Third Party or Entry point to any network, Use in E-commerce system for more secure transaction. In USA about $3.5 trillion pours daily through three major payment networks that dwarf the Bank of New York's. The networks, run by banks and the government over high-speed phone lines, converge at just 10 secret data processing centres nationwide. They transmit everything from direct-deposit pay checks to utility bill payments to huge corporate transfers in the USA and abroad. PayPal in the US, which was recently purchased by EBay, is one of the most frequently used e-payment gateway. In China payment gateway is the single biggest unmet demand because of lack of trusted and secure mechanism. Turkey's payment gateway is difficult to use insecure and highly expensive. In Nepal there are around 3 three banks that are offering Internet Banking Services and majority of middle class are out of such services.

Most of the population will use online payment in near future. Requirements of speedy processing of daily transaction are becoming the basic need for every area business. Therefore everybody is adapting computer technology for his or her business. Most of the Third world countries lagged behind in making a good Internet architecture. There is need of a secure online payment gateway in developing countries .On the basis of proposed architecture of e-payment system of third world countries (Developing Countries). Most of the population doesn't

trust on the local existing online payment gateway because it is not very secure. E-payment gateway today present is not very secure. The proposed payment architecture is made by secure implementation of secure electronic transaction method. Because of this now only authenticate customer can now perform transactions. We modify our gateway by making it more secure, low cost transaction, more feasible to user. If this system is to be implemented in developing countries then strong support of government of that country is required as there is not much awareness of electronic transaction in developing countries.

The electronic payment gateway is made enough secure that any authorized customer can easily trust on it & confidently made payment over internet. The proposed architecture is made secure by the implementation of secure electronic transaction methods. Because of this only authentic customers can now buy products from merchant's site whose bank accounts is enough to buy the required product. At first it's checked if the customer is authorized one or not then the whole transaction takes place. E-payment gateway that fulfil their all requirements and provide security, privacy etc. On the basis of these requirements and the local infrastructure, we propose an electronic payment gateway for local environment. Electronic Payment entrance is gift in our country however it's not terribly secure. The planned payment design was conjointly lacking the protection issue. That planned design is created secure by the implementation of secure electronic group action strategies. The electronic payment entrance is created secure enough that any licensed client will simply trust on that and intrepidly or with confidence create payments over the net. If this method is to be enforced in developing countries then robust support of state of that country is needed as there's not a lot of awareness of electronic group action in developing countries.

VI. TECHNIQUES & ALGORITHM

There are various algorithms on actions of client, merchant

a) Algorithm of Client: Client can browse merchant's website. After selection of items he can send payment order to e-payment server after filling required fields e.g. Credit card no., expiry date etc.

Client:
Start and connect
Start Customer browse merchant website
If select Category then
Go to Item list of selected category
If Select Item
Then Show detail of selected item
If Want to buy selected item
Then select Add to order form
Else Go back to category
If select add to order form
Do Add To Order Sub Category Id
go to Order form and fill required fields like
credit card No., expiry Date, and telephone no,
Address
Select Submit
Else continue shopping

Else Cancel
If select submit Display Authorization
If Credit card no. Text is equal to Credit card
no. display This Customer is Authorized From Bank

b) Algorithm of Payment gateway: Server receives payment order sent by clients, decrypt and encrypt that message and send it to Client bank. Client bank will send a payment deduction message to server and server will send it to Merchant Bank. Merchant bank will send an acknowledgment message to Server and server will send it to merchant.

Payment gateway:
Start connection
If connected
Receive payment message
Else display Not Connected
If receive payment message
{Decrypt message
Split and send it to different textboxes
Add to database
Sent it to Client bank}
Else Cancel
If client bank is sending message
{Receive it
Send it to merchant bank}
Else wait
If merchant bank is sending message
{Receive it
Send it to Merchant}

c) Algorithm of Client Bank: Client bank receives payment message and verify client. Deduct amount from client bank and send that amount to payment gateway.

Client Bank:
Start connection
If connected
Receive payment message including client's
info
If client's info is present in database of bank
Send message to server This customer is
Authorized
Else Send message This customer is not
Authorized
If customer is authorized
{Save payment request into database
Deduct amount from Client bank Send that amount to
Payment Gateway}

sd) Algorithm of Merchant Bank: Merchant bank verifies merchant, receives payment message from Client bank through payment server and add payment to Merchant's account.

Merchant Bank:
Start connection
If connected
Receive payment message including
merchant account no.
If merchant's account is present in database
of bank
{Receive payment Add payment to Merchant's account}
Else Send message Invalid account no.

e) Algorithm of Merchant: Merchant makes and updates website and receives acknowledgement messages from payment gateway.

Merchant
Start connection
If connected
{Make and update website
If server is sending message
Receive message and decrypt it}
Else retry to connect

V. ANALYSIS OF PROBLEMS

Electronic Payment Gateway is present in our country but it's not very secure. The existing payment architecture was also lacking the security factor. Most people Doesn't trust on online shopping or online transaction because of security. Security is the main issues behind designing of Gateway. That's why the proposed architecture is made secure by the implementation of secure electronic transaction methods. Because of this now only authentic customers can now buy products from merchant's site whose bank accounts is enough to buy the required product. At first it's checked if the customer is authorized one or not then the whole transaction takes place. The electronic payment gateway is made secure enough that any authorized customer can easily trust on it and fearlessly or confidently make payments over the Internet. If this system is to be implemented in developing countries then strong support of government of that country is required as there is not much awareness of electronic transaction in developing countries.

VI. WORKING MODULE

This system is for developing countries where a person doesn't go for online shopping because of security issues.

1) A website to receive transaction for different companies:

- Users can register on this site who wants to perform transaction through internet banking

- Users have to login on this site.

- Users can pay to multiple companies/organization through this site.

- Users can view previous all transactions/company wise made by him.

- This site will accept transaction information according to company setting. Such as for Tata-sky recharge it will ask for Subscriber ID idea recharge it will ask phone no.

- The accepted transaction will be encrypted by using public key of appropriate bank. Then this transaction will be send to gateway server.

- A site administrator will control complete site.

- Administrator will be able to register different companies whose transaction will be accepted through this site.

- Administrator can enable or disable Users if required.

2) A Gateway server to redirect transaction to Bank Servers:

- This gateway server will have a registry of banks.

- In registry banks can be registered.

- Only transaction of registered banks will be accepted.

- This server will have dedicated connection with bank servers For fast processing of transactions.

- It will be multithreaded so that multiple transactions can be processed at a time.

- It will receive packets in encrypted form and will redirect them to appropriate bank server according to bank code.

3) Multiple Bank Servers to perform transactions:

- Each bank server will have its separate database.

- Each bank will have separate public & private keys.

- The public key will be published so that it can be used by any application who wants to send transactions.

- Bank server will be always ready to accept transaction packets.

- When packet is received it will be decrypt packet by using private key of the Bank.

- Transaction will be processed & result will be redirected to client.

VII. EXPERIMENTAL RESULTS AND DISCUSSION

After the implementation E-payment Gateway we got the result as follows

- There is connection establishment in client and merchant bank and encrypted packet are send .the packets are encrypted with RSA algorithm.
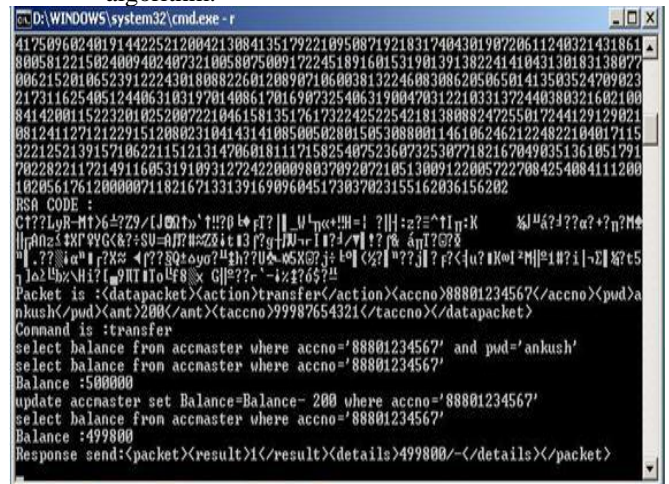

Fig.2.Result at Client Bank

- After key Exchange and verification by gateway, the transaction takes place and amount will deposit in merchant bank.
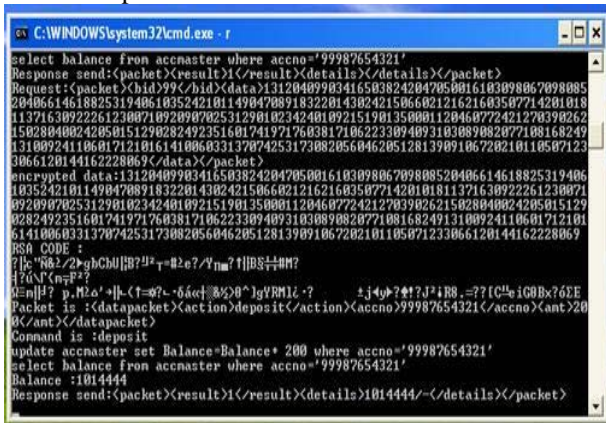

Fig.3.Result at Merchant Bank

- At the gateway Server we can see the connections from both the banks after key exchange.
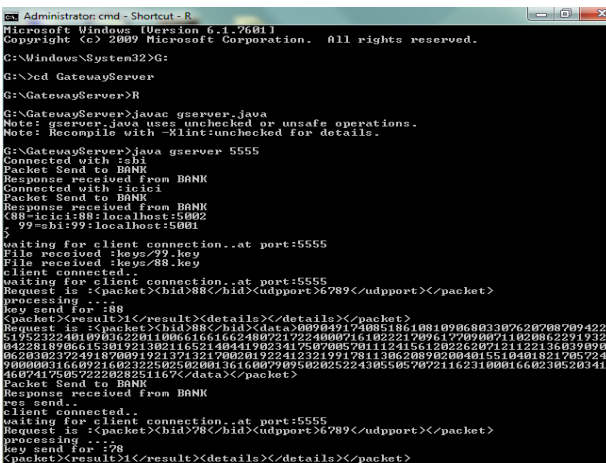

Fig.3.Result at Gateway Server

VIII. CONCLUSIONS

The architecture is made secure by the implementation of secure electronic transaction methods. At first it's checked if the customer is authorized one or not then the whole transaction takes place. E-payment gateway that fulfil their all requirements and provide security, privacy etc. attributable to this currently solely authentic customers will currently get merchandise from merchant's web site whose bank accounts is enough to shop for the desired product. initially it's checked if the client is allowed one or not then the full group action takes place. The electronic payment entrance is created secure enough that any licensed client will simply trust on that and intrepidly or with confidence create payments over the net.

The electronic payment gateway is made secure enough that only authorised customer easily trust on it & confidentially make a payment over internet.

ACKNOWLEDGMENT

REFERENCES

[1] Prof.Gopi Krishna, Dr.R.Shiva Ram Prasad "PROPOSED MODEL FOR REQUIREMENT OF E-PAYMENT GATEWAY" Vol.1 Issue 2 Dec 2011 152-168
[2] Ailya Izhar, Aihab Khan, Sikandar Hayat Khiyal, Wajeeh Javed, shiraz Baig "DESIGNING AND IMPLEMENTATION OF ELECTRONIC PAYMENT GATEWAY FOR DEVELOPING COUNTRIES" vol. 26 No.2 April 2011
[3] Aboba, B., Arkko, J., Harrington, D. 2000. Introduction to accounting management. RFC 2975 (October).
[4] Hakala, H., Mattila, L., Koskinen, J-P., Stura, M., Loughney, J. 2005. Diameter creditcontrol application. RFC 4006 (August).
[5] Wondwossen Tadesse, Tsegaye G/Medhin, Solomon Atnafu, Dawit Bekele:"e-Payment in Ethiopia: Challenges and Opportunities" Forum on ICTs, Trade and EconomicvGrowth. March 14 – 16, 2006
[6] Rosenberg, J., Schulzrinne, H., Camarillo,G., Johnston, A., Peterson, J., Sparks, Handley, M., Schooler, E. 2002. SIP: Session Initiation Protocol. RFC 3261 (June).
[7] Book "cryptography and network security: Principles and practice" by William stalling 3rd edition, vol: 7, August 2004
[8] Jennings, C., Fischl, J., Tschofenig, H., Jun, G. 2006. Payment for services in Session Initiation Protocol (SIP). draft-jenningssipping-pay-05.txt (October).
[9] Süleyman Kondakci: "An Approach to a National E-Payment Architecture" IT Consortium of Turkey,Division of Information Security, 2002
[10] Vivek S. rana, Chief IT/MTS Nepal Banks Limited: "Banking and e payment practices in Nepal"s December 2004
[11] Rajib Subba: "e-Payment for SME Exporters: Payment for SME Exporters: Drivers and Barriers" Regional Business Forum on e-Finance Bangkok, Thailand