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HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATION AND TECHNOLOGY

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**REPORT**

Course: Web Information System

Banking API Integration

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# **Introduction**

Nowadays, online payment becomes more popular in our life. It helps customers pay their bills easily without taking too much cash themselves. One of the most popular platforms that help business implement online payment is VNPAY. VNPAY payment gateway is an intermediary gateway connecting business with banks, allowing customers to use card / bank account, QR code payment technology (QR Code) on Mobile Banking application to pay Payment transactions.

# **Connection model**

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Figure 1: Connection model using VNPAY

**Step 1:​** Customers make purchases on E-commerce website and make online payment for Orders  
**Step 2:​** E- commerce website established a payment request in the form of a URL bearing payment information and redirecting customers to VNPAY Payment Gateway with that URL. VNPAY payment gateway handles the Payment request sent by E-commerce website. Customers proceed to enter the information required to make the Payment.

**Step 3,4:​** Customers enter information to verify their bank accounts and verify transactions.

**Step 5:​** Successful transactions at the Bank, VNPAY proceeds:

* Redirecting customers to E-commerce website ( ​vnp\_ReturnUrl​)
* Inform E-commerce Website of payment results of customers through I​PN URL​.
* Merchant updates VNPAY payment results sent at this URL.

**Step 6:​** Merchant displays transaction results to customers

# **Implementation**

## **Create payment URL**

Payment URL contains payment information and is sent to VNPAY payment gateway when making online payment for customers.

* Example of a payment URL:

http://sandbox.vnpayment.vn/paymentv2/vpcpay.html?vnp\_Amount=10000000&vnp\_BankCode=NCB&vnp\_Command=pay&vnp\_CreateDate=20170829103111&vnp\_CurrCode=VND&vnp\_IpAddr=172.16.68.68&vnp\_Locale=vn&vnp\_Merchant=DEMO&vnp\_OrderInfo=Nap+tien+cho+thue+bao+0123456789.+So+tien+100%2c000&vnp\_OrderType=topup&vnp\_ReturnUrl=http%3a%2f%2fsandbox.vnpayment.vn%2ftryitnow%2fHome%2fVnPayReturn&vnp\_TmnCode=2QXUI4J4&vnp\_TxnRef=23554&vnp\_Version=2&vnp\_SecureHashType=SHA256&vnp\_SecureHash=e6ce09ae6695ad034f8b6e6aadf2726f

* Parameter list:

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Figure 2: Parameter list of VNPAY payment URL

* Note:
  + The checksum data is established based on the ascending sort of the parameter name (QueryString).
  + vnp\_BankCode: This value is optional.  
    - If left blank, the customer will choose the payment bank at VNPAY.  
    - If setting the value (select the Paying Bank at E-commerce Website), Refer to the Value at [the Banking Code Table](https://sandbox.vnpayment.vn/apis/danh-sach-ngan-hang/)
  + In the payment URL, there vnp\_ReturnUrl is a parameter that informs the transaction result when the Customer finishes payment

## **Code IPN URL**

This is the address to receive payment results from VNPAY. Current connection uses the method GET

On the call VNPAY URL, there is payment information to base on that result E-commerce website handles the next steps (for example, updating payment results to Database ...).

* Example of an IPN URL:

http://sandbox.vnpayment.vn/tryitnow/Home/VnPayIPN?vnp\_Amount=1000000&vnp\_BankCode=NCB&vnp\_BankTranNo=20170829152730&vnp\_CardType=ATM&vnp\_OrderInfo=Thanh+toan+don+hang+thoi+gian%3A+2017-08-29+15%3A27%3A02&vnp\_PayDate=20170829153052&vnp\_ResponseCode=00&vnp\_TmnCode=2QXUI4J4&vnp\_TransactionNo=12996460&vnp\_TxnRef=23597&vnp\_SecureHashType=SHA256&vnp\_SecureHash=20081f0ee1cc6b524e273b6d4050fefd

* Parameter list:

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Figure 3: Parameter list of VNPAY IPN URL

* Note:
  + The merchant / e-commerce website checks the integrity of the data (checksum) before performing any other operations
  + Update / process results after payment is done at this URL
  + Merchant returns data to VNPAY in JSON format

## **Code Return URL**

VNPAY data is returned by redirecting the customer's web browser to the web address that Merchant provided when sending payment request. This URL contains information about the payment results of customers.

* Example of a return url:

http://sandbox.vnpayment.vn/tryitnow/Home/VnPayReturn?vnp\_Amount=1000000&vnp\_BankCode=NCB&vnp\_BankTranNo=20170829152730&vnp\_CardType=ATM&vnp\_OrderInfo=Thanh+toan+don+hang+thoi+gian%3A+2017-08-29+15%3A27%3A02&vnp\_PayDate=20170829153052&vnp\_ResponseCode=00&vnp\_TmnCode=2QXUI4J4&vnp\_TransactionNo=12996460&vnp\_TxnRef=23597&vnp\_SecureHashType=SHA256&vnp\_SecureHash=20081f0ee1cc6b524e273b6d4050fefd

* Parameter list: Same as IPN URL
* Note:
  + This URL only checks data integrity (checksum) and displays notifications to customers
  + Do not update transaction results at this address

# **Demo VNPAY integration with PHP**

* Create a bill

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* Carry out payment

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* After entering the card information, customers will be authorize using OTP Code

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* After authorizing successfully, customers will get the following result:

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# **References:**

<https://sandbox.vnpayment.vn/apis/>