NetPayClient
Merchant Operation Manual
(for Cross-border Settlement)

Version 1.2

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Revision History

Date	Version	Description	Author
2013-04-03	1.2	Adjust the display format, and change TransAmt's description when CuryId's value equals to "JPY"	Ye.qingqing
2012-08-08	1.1.3	Change from transget to TransGet in the fifth question of Appendix A	Xi.nan
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		Adjust the display format for Appendix	
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2011-10-13	1.1.1	Correcting a number of factual details	Qi.shuangshuang
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2010-11-15	0.1.12	Change the value of return URLs in Payment and Refund	Ye.qingqing
2010-09-02	0.1.11	NetPayClient_Merchant Operational Manual oversea version.	Ye.qingqing

Contents

1. Backgrounds

NetPayClient is an API Lib installed on the client side of ChinaPay's authorized merchants. It integrates with merchants' online system to provide secure online payment method between customers, merchants and banks. Its main functions can be described as follows:

- Bankcard online payments of merchants' transaction
- Merchants' refund operation to successful transaction
- Merchants' enquiry operation to existing payment transaction

1.1 Recommendations for use

The main purpose of this manual is to help ChinaPay's merchant members to use the API ChinaPay supplied. It mainly include three parts:

Part 1: NetPayClient's functionality and use practice;
Part 2: The process of all versions of NetPayClient's installation and deployment;
Part 3: Appendix. Show common error codes during the process of program and a few notes on integrating API.

1.2 User

The manual's target user is ChinaPay merchant member's on-line application development personnel, the attendants and the administrative personnel.

1.3 Operation procedure

For developers' quick and precise application development, ChinaPay recommends the procedures as follows:

Step 1: Choose the version of NetPayClient which is suitable to merchant's actual demand; [refer to Chapter2.2]
Step 2: Install selected NetPayClient; [refer to Chapter 3.1]
Step 3: Choose desired functions (payment, query, refund); [refer to Chapter 3.2, 3.3, 3.4]
Step 4: Query the response code appeared during the payment transaction; [refer to Appendix B]
Step 5: Finish the operation follow response codes.

2. Introduction and use practice of NetpayClient

2.1 Functionality

NetPayClient is an API Lib installed on the client side of ChinaPay's authorized merchants. It integrates with merchants' online system to realize secure online payment between customers, merchants and banks. It offers functions as follows:

- Merchant carries on digital signature to the key information of an order;

- Merchant verifies the response code sent by ChinaPay;
- Merchant signs a string;
- Merchant verifies the signature of a string.

2.2 Types of version

Merchant chooses appropriate development platform and operating platform according to his actual situation. ChinaPay will offer relative version of NetPayClient. Now, ChinaPay's NetPayClients are as follows:

- **NetPayClient for Java** （in JAR，for Java development）
- **NetPayClient for Win32** （in DLL，for Windows system development）
- **NetPayClient for C** (in.so or.a，for UNIX LINUX FreeBSD etc.development)
- **NetPayClient for C#** （in DLL，for Windows system development）
- **NetPayClient for PHP** （in PHP，for PHP development）

3. NetpayClient's Installation and invocation

3.1 NetPayClient's installation

3.1.1 NetPayClient for JAVA Function Description

3.1.1.1 File list

Name	Path	Usage
netpayclinet.jar	Installed in the corresponding pathaccording to the need of project	To provide the method of deploying digital signature
MerPrk.key	Unspecified, but needed to deploy function appointed file path and file name	Merchant's private key
PgPubk.key	Unspecified, but needed to deploy function appointed file path and file name	ChinaPay's public key

3.1.1.2 Method Description

- **Function buildKey**-to build public key/private key

Function Description:

public boolean buildKey (String MerId, int KeyUsage, String KeyFile)

Function：

To build public key/private key for generating signature or verifying digital signature

Parameter Description：

String MerId: merchant ID， it is defined as an array of digits with the length of 15 and is assigned by ChinaPay

int KeyUsage: the way of using public/private key, fixed value is 0

String KeyFile: file path of public/private key(including file name) e.g. "d:\\MerPrk.key”

Return Value：

true : represents correct public/private key is found, and can use function of digital signature and digital signature verification

false: represents failure of building public/private key, can’t use function of digital signature and digital signature verification

Note： The method is in the class of chinapay. PrivateKey

- **Function signOrder** – to generate digital signature

Function Description ：

public String signOrder(String MerId, String OrdId, String TransAmt, String CuryId, String TransDate, String TransType)

Function:

To generate digital signature for inputted parameters

Parameters Description:

String MerId – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay.

String OrdId – order number. It is specified as a 16-byte long numeric string that is generated by the merchant’s system, and previously failed transactions could be paid again.

String TransAmt– transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string “000000001234” represents 12.34RMB or 12.34USD in this case. NOTE: If the value of CuryId is JPY, the last two numbers of TransAmt’s value should be “00”.

String CuryId – the type of the currency used. It is a string containing 3 bytes. For example,”156”represents RMB,”JPY” represents Japanese yen, ”USD” represents U.S. dollar.

String TransDate– the date of the transaction. This numeric string is defined with the length of 8 to represent the transaction date with the format of YYYYMMDD.

String TransType – the transaction type. It is a string sized 4 and values between “0001” and “0002”. Hereinto, “0001” represents payment transaction and “0002” refers to refund transaction.

Return Value:

String CheckValue[256] -- It is a digital signature string with the length of 256 bytes. It is generated using the input parameter values listed above

Note: The method is in class chinapay. SecureLink

- **Function verifyTransResponse**-to verify transaction response

Function Description :
public boolean verifyTransResponse(String MerId, String OrdId, String TransAmt, String CuryId, String TransDate, String TransType, String OrderStatus, String CheckValue)

Function:
To verify digital signature for inputted parameters.

Parameters Description:
String MerId – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay.
String OrdId – order number. It is specified as a 16-byte long numeric string that is generated by the merchant's system, and previously failed transactions could be paid again.
String TransAmt– transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string "000000001234" represents 12.34RMB or 12.34USD in this case. NOTE: If the value of CuryId is JPY, the last two numbers of TransAmt's value should be "00".
String CuryId – the type of the currency used. It is a string containing 3 bytes. For example,"156"represents RMB,"JPY" represents Japanese yen, "USD" represents U.S. dollar.
String TransDate– the date of the transaction. This numeric string is defined with the length of 8 to represent the transaction date with the format of YYYYMMDD.
String TransType – the transaction type. It is a string sized 4 and values between "0001" and "0002". Hereinto, "0001" represents payment transaction and "0002" refers to refund transaction.
String OrderStatus– the status of the transaction. It is specified as an array of numbers sized4. See the " transaction response code table" for details.
String CheckValue - check value. It is the digital signature value with 256 bytes generated by ChinaPay based on the transaction results.

Return Value:
true :means success. That is to say, it is ChinaPay who sends the result to the merchant. And the merchant will be responsible for the subsequent processing. All the other return values indicate the failure of the function and the results can be ignored or simply put into the "garbage bin".

Note: This method is in class chinapay. SecureLink

- **Function Sign**-to generate digital signature for a string

Function Description :
public String Sign (String SignMsg)

Function:
To generate digital signature for inputted string of parameters

Parameters Description:
String SignMsg : is applied in the string for signature

Return value:
String CheckValue[256] -- It is a digital signature string with the length of 256 bytes. It is generated using the input parameter values listed above

Note: This method is in class chinapay. SecureLink

- **Function verifyAuthToken**- to verify signature for a string

Function Description :
public boolean verifyAuthToken (String PlainData, String CheckValue)

Function:
To verify the digital signature of target string

Parameters Description:
String PlainData- is applied in the string which generates digital signature
String CheckValue- Verification value, to verify signature of a 256-byte string

Return value:
True: represents success, otherwise is failure

Note: This method is in class chinapay. SecureLink

3.1.1.3 Sample codes

（the following code is not verified and only for reference）

- **Sign code**

```
//Initializing key files：
chinapay.PrivateKey key=new chinapay.PrivateKey();
chinapay.SecureLink t;
boolean flag;
String MerId, OrdId, TransAmt, CuryId, TransDate, TransType,ChkValue;
String plainData, ChkValue2 ;

flag=key.buildKey(MerId,0,"app/usr/chinapay/keys/MerPrk.key");
if (flag==false)
{
System.out.println("build key error!");
return;
}
```

```
t=new chinapay.SecureLink (key);
// sign a order
ChkValue= t.signOrder(MerId, OrdId, TransAmt, CuryId, TransDate, TransType) ;
// sign a string
plainData = "test sign data ";
ChkValue2 = t.Sign(plainData) ;
```

- **Verify Signature Sample Codes**

```
chinapay.PrivateKey key=new chinapay.PrivateKey();
chinapay.SecureLink t;
boolean flag;
boolean flag1;
String MerId, OrdId, TransAmt, CuryId, TransDate, TransType,ChkValue;
String plainData, ChkValue2
flag=key.buildKey("999999999999999",0,"c:\\winnt\\PgPubk.key");
if (flag==false)
{
msg="build key error!";
return;
}
t=new chinapay.SecureLink (key);
flag1=t.verifyTransResponse(MerId,OrdId, TransAmt, CuryId, TransDate, TransType,
OrderStatus, ChkValue);  // ChkValue is return value which ChinaPay reponse sends
if(flag1!=0) {
   // error of signature verification
}

// verify signature for a string
plainData = "test sign data ";
flag1 = t. verifyAuthToken (plainData, ChkValue2) ;  // ChkValue2 is return value which
ChinaPay reponse sends
if(flag1) {
    // error of signature verification
}
```

3.1.2 NetPayClient for Win32 Function Description

3.1.2.1 Key file

Name	Path	Usage
netpay.dll	The same path as ChinaPay.dll , or copy the file to c:\winnt\system32(c:\windows\system for win95,98,etc)	To provide the function of order sign and ChinaPay's signature verification

netpay.lib	Unspecified (such as c:\netpay)	This file is required when invoking netpay.dll for compiling
MerPrk.key	Copy to the same path as windows c:\winnt for NT OR c:\windows for win95,98; or Unspecified, but needed to deploy function appointed file location and file name	Merchant's private key
PgPubk.key	Copy to the same path as windows c:\winnt for NT OR c:\windows for win95,98; or Unspecified, but needed to deploy function appointed file path and file name	ChinaPay's public key
ChinaPay.dll	Unspecified (such as c:\netpay)	Method package with netpay.dll in COM，need to register with regsvr32

- **Installation procedure**

Decompress NetPayClinet for Win32.rar according to installation explanation

- **Install manually**

If there is exception thrown out during installation (probably due to the system abnormity), you may need to follow the procedures below to install the software manually.

Copy all the key files to the specified directory.

Register ChinaPay.dll (put in "regsvr32 [the path of gensign]" in the command line. This control can only work in a VC environment, it is suggested to use "Dependency Walker" to make sure that this DLL file has been set correctly).

3.1.2.2 Method Description

- **Set Private Key Path**- setMerKeyFile

Function Description ：
void setMerKeyFile (String KeyFile)

Function：

Set private key path

Parameters Description:
String KeyFile: file path of private key(including file name) e.g. "d:\\MerPrk.key"

- **Unset private key path**-unsetMerKeyFile

Function Description:
void unsetMerKeyFile ()

Function：
Unset previous private key path, recover default private key path

Parameters Description:
None

- **Set ChinaPay Public Key Path**-setPubKeyFile

Function Description：
void setPubKeyFile (String KeyFile)

Function：
Set ChinaPay Public Key path

Parameters Descripiton:
String KeyFile: file path of private key (including file name) e.g.： "d:\\ PgPubk.key"

- **Unset public key path**- unsetPubKeyFile

Function Description:
void unsetPubKeyFile ()

Function：
Unset previous ChinaPay public key path which setPubKeyFile sets, recover default public key path

Parameters Description：
None

- **Function sign**-generate digital signature for order

Function Description ：
public String sign (String MerId, String OrdId, String TransAmt, String CuryId, String TransDate, String TransType)

Parameters Description:
String MerId – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay or the clearing bank when the merchant agrees to use the service

provided by ChinaPay.

String OrdId – order number. It is specified as a 16-byte long numeric string that is generated by the merchant's system, and previously failed transactions could be paid again.

String TransAmt– transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string "000000001234" represents 12.34RMB or 12.34USD in this case. NOTE: If the value of CuryId is JPY, the last two numbers of TransAmt's value should be "00".

String CuryId – the type of the currency used. It is a string containing 3 bytes. For example,"156"represents RMB,"JPY" represents Japanese yen, "USD" represents U.S. dollar.

String TransDate– the date of the transaction. This numeric string is defined with the length of 8 to represent the transaction date with the format of YYYYMMDD.

String TransType – the type of the transaction. It is a string sized 4 and values between "0001" and "0002". Hereinto, "0001" represents payment transaction and "0002" refers to refund transaction.

Return value:

String CheckValue[256] -- It is a digital signature string with the length of 256 bytes. It is generated using the input parameter values listed above

Note: If COM is not called， load netpay.dll with LoadLibrary, need to find corresponding name with Dependency Walker.

- **Function check**-to verify transaction response

Function Description ：

public String check(String MerId, String OrdId, String TransAmt, String CuryId, String TransDate, String TransType, String OrderStatus, String CheckValue)

Parameters Description:

String MerId – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay or the clearing bank when the merchant agrees to use the service provided by ChinaPay.

String OrdId – order number. It is specified as a 16-byte long numeric string that is generated by the merchant's system, and previously failed transactions could be paid again.

String TransAmt– transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string "000000001234" represents 12.34RMB or 12.34USD in this case. NOTE: If the value of CuryId is JPY, the last two numbers of TransAmt's value should be "00".

String CuryId – the type of the currency used. It is a string containing 3 bytes. For example,"156"represents RMB,"JPY" represents Japanese yen,"USD" represents U.S. dollar.

String TransDate– the date of the transaction. This numeric string is defined with the length of 8 to represent the transaction date with the format of YYYYMMDD.

String TransType – the type transaction. It is a string sized 4 and values between "0001"

and “0002”. Hereinto, “0001” represents payment transaction and “0002” refers to refund transaction.
String OrderStatus– the status of the transaction. It is specified as an array of numbers sized 4. See the “ transaction response Code De” for details.
String CheckValue - check value. It is the digital signature value with 256 bytes generated by ChinaPay based on the transaction results.

Return Value:
The value “0” means that the method has been executed successfully. That is to say, it is ChinaPay who sends the result to the merchant. And the merchant will be responsible for the subsequent processing. All the other return values indicate the failure of the function and the results can be ignored or simply put into the “garbage bin”.

Note:
If COM is called, method return value is “0” in string—means signature verification successful.

If COM is not called, load netpay.dll with LoadLibrary, need to find corresponding name with Dependency Walker.

- **Function signData**-to generate digital signature for a string

Function Description :
public String Sign (String MerId, String SignMsg)

Parameters Description:
String MerId- Merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay
String SignMsg - is applied in the string for signature

Return value:
String CheckValue[256] -- It is a digital signature string with the length of 256 bytes. It is generated using the input parameter values listed above

Note:
If COM is not called， load netpay.dll with LoadLibrary, need to find corresponding name with Dependency Walker

- **Function checkData**- to verify signature for a string

Function Description:
public String checkData (String PlainData, String CheckValue)

Parameters Description:
String PlainData- is applied in the string which generates digital signature
String CheckValue- Verification value, to verify signature of a 256-byte string

Return value:
"0": represents success, otherwise is failure

Note:
If COM is called, method return value is "0" in string—means signature verification successful.

If COM is not called, load netpay.dll with LoadLibrary, need to find corresponding name with Dependency Walker.

3.1.2.3 Sample codes

Take C# for example:
First, transform Com type information into .NET digits tlbimp ChinaPay.dll /out: ChinaPay_tsl.dll (tlbimp is the tool vs.net provides) in the project, if project->add reference，select com，input ChinaPay_tsl.dll

（the following code is not verified and only for reference）

- **Sign Sample Codes**

```
using System;
using ChinaPay_tsl;

namespace ConsoleApplication1
{
   class Class1
   {
        [STAThread]
        public static void Main()
        {
            // Sign
          NetPayClientClass a = new NetPayClientClass();
            // Set private key path
          a.setMerKeyFile("D:\\ MerPrK.key");    // if this method is not called, it will proceed according to the default path
           String ChkValue;
           String MerId;            // merchant id
         // Sign order
          ChkValue=
      a.sign(MerId,"0000000000000001","000000001234","156","20070123","0001");
          // Sign a string
          String ChkValue2;
          String plainData =    "test sign data ";
          ChkValue2= a.signData(MerId,plainData);
```

```
        }
      }
    }
```

- **Verify Signature Sample Codes**

```
using System;
using ChinaPay_tsl;

namespace ConsoleApplication1
{
   class Class1
   {
       [STAThread]
       public static void Main()
       {
          // verify signature
        NetPayClientClass a = new NetPayClientClass();
         // set private key path
       a.setPubKeyFile("D:\\ PgPubk.key");   // if this method is not called, it will
                                              proceed according to the default path
        String ChkValue;
        String MerId; ///merchant id
      //sign order
      string flag =
      a.check(MerId,"070699060500011","000000010000","156","20070615","0001"
      ,"1001", ChkValue); // ChkValue is return value which ChinaPay sends to
      merchant

      // sign a string
      String ChkValue2;
      String plainData =    "test sign data ";
      string flag = a. checkData (plainData, ChkValue2);
                }
               }
   }
```

3.1.3 NetPayClient for C Function Description

3.1.3.1 Key File

Name	Path	Usage
netpayclient.h	Unspecified	Applied in import file of C language etc
libnpc.so / libnpc.a	Unspecified	Method lib of signature data and signature verification (

		apply for .so or .a according to merchants' condition)
MerPrk.key	Set NPCDIR environment variable appointed file path, can't change file name or appoint NPCDIR environment variable, but need to call method appointed file path and name	Merchant signature private key
PgPubk.key	Set NPCDIR environment variable appointed file path, can't change file name or appoint NPCDIR environment variable, but need to call method appointed file path and name	ChinaPay signature public key

3.1.3.2 Method Description

- **Set Private Key Path**- setMerKeyFile

Function Description：
void setMerKeyFile (char keyFile[256])

Function：
Set private key path.

Parameters Description:
char KeyFile: file path of private key(including file name) e.g. "d:\\MerPrk.key"

- **Unset private key path**-unsetMerKeyFile

Function Description:
void unsetMerKeyFile ()

Function：
Unset previous private key path, recover default private key path

Parameters Description:
None

- **Set ChinaPay Public Key Path**-setPubKeyFile

Function Description：
void setPubKeyFile (char keyFile[256])

Function：

Set ChinaPay Public Key path

Parameters Description:
char keyFile: file path of private key(including file name) e.g.: "d:\\ PgPubk.key"

- **Unset public key path**- unsetPubKeyFile

Function Description:
void unsetPubKeyFile ()

Function:
Unset previous ChinaPay public key path which setPubKeyFile sets, recover default public key path

Parameters Description:
None

- **Generate digital signature Function** – signOrder

Function Description:
int signOrder(char MerId[15], char OrdId[16], char TransAmt[12], char CuryId[3], char TransDate[8], char TransType[4], char CheckValue[256])

Function:
To generate digital signature for inputted parameters.

Parameters Description:
char MerId[15] – merchant ID. It is defined as an array of digits with the length of 15. ChinaPay or the clearing bank assigns it to the authorized merchants.
char OrdId[16] – order number. It is an array of numbers and has the length of 16, generated by the merchant's system and only the previously failed orders are allowed to be performed again.
char TransAmt[12] – transaction amount. It is specified as an array of numbers sized 12. For example, the string "000000001234" represents 12.34RMB or 12.34USD in this case. NOTE: If the value of CuryId is JPY, the last two numbers of TransAmt's value should be "00".
char CuryId[3] – the type of the currency used. It is an array of numbers and has a size of 3. For example,"156"represents RMB,"JPY" represents Japanese yen, "USD" represents U.S. dollar.
char TransDate[8] – the date of the transaction. This variable is defined as an array of numbers sized 8 and the format defined is YYYYMMDD.
char TransType[4] – the type of the transaction. It is a four-bytes long array and values between "0001" and "0002". "0001" represents payment transaction and "0002" refers to refund transaction.
char CheckValue[256] – check value. It is the digital signature value generated by

ChinaPay based on the transaction results.

Return value:
The value "0" means that the method has been executed successfully. Otherwise means failure.

- **Verify transaction response** -verifyTransResponse

Function Description:
int verifyTransResponse(char MerId[15], char OrdId[16], char TransAmt[12], char CuryId[3], char TransDate[8], char TransType[4], char OrderStatus[4], char CheckValue[256])

Function:
To verify digital signature of target string.

Parameters Description:
String MerId[15] – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay or the clearing bank when the merchant agrees to use the service provided by ChinaPay.
String OrdId[16] – order number. It is specified as a 16-byte long numeric string that is generated by the merchant's system, and previously failed transactions could be paid again.
String TransAmt[12] – transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string "000000001234" represents 12.34RMB or 12.34USD in this case. NOTE: If the value of CuryId is JPY, the last two numbers of TransAmt's value should be "00".
String CuryId[3] – the type of the currency used. It is a string containing 3 bytes. For example,"156"represents RMB,"JPY" represents Japanese yen, "USD" represents U.S. dollar.
String TransDate[8] – the date of the transaction. This numeric string is defined with the length of 8 to represent the transaction date with the format of YYYYMMDD.
String TransType[4] – the transaction type. It is a string sized 4 and values between "0001" and "0002". Hereinto, "0001" represents payment transaction and "0002" refers to refund transaction.
String OrderStatus[4] – the status of the transaction. It is specified as an array of numbers sized4. See the " transaction response code table" for details.
String CheckValue[256] - check value. It is the digital signature value with 256 bytes generated by ChinaPay based on the transaction results.

Return Value:
The value "0" means that the method has been executed successfully. That is to say, it is ChinaPay who sends the result to the merchant. And the merchant will be responsible for the subsequent processing. All the other return values indicate the failure of the function and the results can be ignored or simply put into the "garbage bin".

- **generate digital signature for a string** – signData

Function Description:
int signData (char MerId[15]， char *SignMsg， char ChkValue[256])

Function:
To generate digital signature for inputted string of parameters

Parameters Description:
char MerId[15] - merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay
char *SignMsg - is applied in the string for signature
char CheckValue[256] -It is a digital signature string with the length of 256 bytes. It is generated using the input parameter values listed above

Return value:
0 means successful, otherwise is error codes.

- **Verify signature for a string** –verifySignData

Function Description:
int verifySignData (char * PlainData, char CheckValue[256])

Function:
To verify the digital signature of target string

Parameters Description:
char* PlainData - is applied in the string which generates digital signature
char CheckValue[256]- Verification value, to verify signature of a 256-byte string

Return value:
The value “0” means that the method has been executed successfully. That is to say, it is ChinaPay who sends the result to the merchant. And the merchant will be responsible for the subsequent processing. All the other return values indicate the failure of the function and the results can be ignored.

3.1.3.3 Sample Code

- **Sign Sample Code**

（the following code is not verified and only for reference）

```
#include <stdio.h>
#include <stdlib.h>
#include "netpayclient.h"
```

```
int main (int argc, char* argv[])
{
    char MerId[16];
        char OrdId[17];
        char TransAmt[13];
        char CuryId[4];
        char TransDate[9];
        char TransType[5];
    char ChkValue[257];
    int flag;

setMerKeyFile("/app/netpay/key/MerPrk.key");    // if it is not set, files will be acquired
                                                  according to NPCDIR environment variables


// Sign a order
flag =signOrder(MerId, OrdId, TransAmt, CuryId, TransDate, TransType, ChkValue);
if(flag != 0) {
    // signature failure
}

// sign a string
plainData = "test sign data ";
flag = signData (MerId ,plainData, ChkValue);    // ChkValue is the signature of the string
if(flag != 0) {
    // signature failure
}
}
```

- **Verify Signature Sample Code**

（the following code is not verified and only for reference）

```
#include <stdio.h>
#include <stdlib.h>
#include "netpayclient.h"

int main (int argc, char* argv[])
{
    char MerId[16];
        char OrdId[17];
        char TransAmt[13];
        char CuryId[4];
        char TransDate[9];
        char TransType[5];
    char ChkValue[257];
    char OrderStatus[5];
```

```
    int flag;

    setPubKeyFile ("/app/netpay/key/PubPrk.key");    // if it is not set, files will be acquired
                                                     according to NPCDIR environment
variables

    // receive digits that ChinaPay returns: MerId, OrdId, TransAmt, CuryId, TransDate,
    TransType OrderStatus ,ChkValue
    // sign the verified order
    flag = verifyTransResponse(MerId, OrdId, TransAmt, CuryId, TransDate, TransType,
OrderStatus ,ChkValue);
    if(flag != 0) {
        // signature failiure
    }

    // sign a string
    plainData = "test sign data ";
    flag = verifySignData (plainData, ChkValue);    // ChkValue is return value which
                                                    ChinaPay sends to merchant

    if(flag != 0) {
        // signature failure
            }
    }
```

3.1.4 NetPayClient for C# Function Description

3.1.4.1 Key file

Name	Path	Usage
netpay.dll	Installed in the corresponding pathaccording to the need of project	To provide the method of deploying digital signature
MerPrk.key	Unspecified, but needed to deploy function appointed file path and file name	Merchant's private key
PgPubk.key	Unspecified, but needed to deploy function appointed file path and file name	ChinaPay's public key

3.1.4.2 Instruction

- Installed netpay.dll in the corresponding path according to the need of project;
- In the development environment, using "add citing", add netpay.dll into project, then call it directly.

3.1.4.3 Method Description

- **Function buildKey**-to build public key/private key

Function Description：
public boolean buildKey (String MerId, int KeyUsage, String KeyFile)

Function：
To build public key/private key for generating signature or verifying digital signature

Parameter Description：
String MerId: merchant ID， it is defined as an array of digits with the length of 15 and is assigned by ChinaPay
int KeyUsage: the way of using public/private key, fixed value is 0
String KeyFile: file path of public/private key(including file name) e.g. "d:\\MerPrk.key”

Return Value：
true : represents correct public/private key is found, and can use function of digital signature and digital signature verification
false: represents failure of building public/private key, can’t use function of digital signature and digital signature verification

Note： The method is in class netpay. NETPAY, which also can judge the current status of public/private key via NetPay.NETPAY.PrivateKeyFlag or NetPay.NETPAY.PublicKeyFlag.

- **Function signOrder – to generate digital signature**

Function Description:
public String signOrder(String MerId, String OrdId, String TransAmt, String CuryId, String TransDate, String TransType)

Function:
To generate digital signature for inputted parameters

Parameters Description:
String MerId – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay.
String OrdId – order number. It is specified as a 16-byte long numeric string that is generated by the merchant’s system, and previously failed transactions could be paid again.
String TransAmt– transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string “000000001234” represents 12.34RMB or 12.34USD in this case. NOTE: If the value of CuryId is JPY, the last two numbers of TransAmt’s value should be “00”.
String CuryId – the type of the currency used. It is a string containing 3 bytes. For example,”156”represents RMB,”JPY” represents Japanese yen, ”USD” represents U.S. dollar.
String TransDate– the date of the transaction. This numeric string is defined with the

length of 8 to represent the transaction date with the format of YYYYMMDD.
String TransType– the type of transaction. It is a string sized 4 and values between "0001" and "0002". Hereinto, "0001" represents payment transaction and "0002" refers to refund transaction.

Return value:

String CheckValue -- It is a digital signature string with the length of 256 bytes. It is generated using the input parameter values listed above

Note: The method is in class netpay. NETPAY

- **Function verifyTransResponse**-to verify transaction response

Function Description:
public boolean verifyTransResponse(String MerId, String OrdId, String TransAmt, String CuryId, String TransDate, String TransType, String OrderStatus, String CheckValue)

Function:
To verify the digital signature of inputted parameters.

Parameters Description:
String MerId – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay.
String OrdId – order number. It is specified as a 16-byte long numeric string that is generated by the merchant's system, and previously failed transactions could be paid again.
String TransAmt– transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string "000000001234" represents 12.34RMB or 12.34USD in this case. NOTE: If the value of CuryId is JPY, the last two numbers of TransAmt's value should be "00".
String CuryId – the type of the currency used. It is a string containing 3 bytes. For example,"156"represents RMB,"JPY" represents Japanese yen, "USD" represents U.S. dollar.
String TransDate– the date of the transaction. This numeric string is defined with the length of 8 to represent the transaction date with the format of YYYYMMDD.
String TransType – the transaction type. It is a string sized 4 and values between "0001" and "0002". Hereinto, "0001" represents payment transaction and "0002" refers to refund transaction.
String OrderStatus– the status of the transaction. It is specified as an array of numbers sized4. See the " transaction response code table" for details.
String CheckValue - check value. It is the digital signature value with 256 bytes generated by ChinaPay based on the transaction results.

Return Value:
true :means success. That is to say, it is ChinaPay who sends the result to the merchant.

And the merchant will be responsible for the subsequent processing. All the other return values indicate the failure of the function and the results can be ignored or simply put into the “garbage bin”.

Note: This method is in class netpay. NETPAY.

- **Function Sign**-to generate digital signature for a string

Function Description:
public String Sign (String SignMsg)

Function:
To generate digital signature for inputted string of parameters

Parameters Description:
String SignMsg : is applied in the string for signature

Return value:
String CheckValue[256] -- It is a digital signature string with the length of 256 bytes. It is generated using the input parameter values listed above

Note: This method is in class netpay. NETPAY

- **Function verifyAuthToken**- to verify signature for a string

Function Description:
public boolean verifyAuthToken (String PlainData, String CheckValue)

Function:
To verify the digital signature of target string

Parameters Description:
String PlainData- is applied in the string which generates digital signature
String CheckValue- Verification value, to verify signature of a 256-byte string

Return value:
True: represents success, otherwise is failure

Note: This method is in class netpay. NETPAY

3.1.4.4 Sample Codes

（the following code is not verified and only for reference）

- **Sign Sample Code**

```
string MerId, OrdId, TransAmt, CuryId, TransDate, TransType,ChkValue;
string plainData, ChkValue2 ;

///Initializing key file：
if (NetPay.NETPAY.buildKey("808080290000001", 0, "c:\\key\\MerPrk.key"))
{
    showInfo(">>set privatekey:succeed \r\n\r\n");
}

// sign a order
if (NetPay.NETPAY.PrivateKeyFlag)
{
    string ChkValue = NetPay.NETPAY. signOrder(MerId, OrdId, TransAmt, CuryId,
TransDate, TransType) ;
    showInfo(">> plaintext:" + ostr + "\r\n\r\n");
    showInfo(">>ciphertext:" + ChkValue + "\r\n\r\n");
}

// sign a string名
string plainData =
"8080802900000010000000010273765000000000001156201008060001";
if (NetPay.NETPAY.PrivateKeyFlag)
{
    string ChkValue2 = NetPay.NETPAY. Sign(plainData);
    showInfo(">>plaintext:" + ostr + "\r\n\r\n");
    showInfo(">>ciphertext:" + ChkValue + "\r\n\r\n");
}
```

- **Verify Signature Sample Code**

```
String MerId, OrdId, TransAmt, CuryId, TransDate, TransType,ChkValue;
String plainData, ChkValue2
//Initializing key file：
if (NetPay.NETPAY.buildKey("999999999999999", 0, "c:\\key\\PgPubk.key"))
{
    showInfo(">>set public key:succeed \r\n\r\n");
}

// verify signature for a order
if (NetPay.NETPAY.PublicKeyFlag)
{
    bool flag= NetPay.NETPAY.verifyTransResponse(MerId,OrdId, TransAmt, CuryId,
TransDate, TransType, OrderStatus, ChkValue);  // ChkValue is return value which
ChinaPay reponse sends
    showInfo(">>plaintext:" + ostr + "\r\n\r\n");
    showInfo(">>ciphertext:" + check + "\r\n\r\n");
    showInfo(">>verify signature:" + result + "\r\n\r\n");
```

```
        if(!flag) {
                // error of signature verification
        }
    }

    // verify signature for a string
    plainData = "test sign data ";

    if (NetPay.NETPAY.PublicKeyFlag)
    {
        bool result = NetPay.NETPAY.verifyAuthToken(plainData, ChkValue2); // ChkValue2
    is return value which ChinaPay reponse sends
        showInfo(">>plaintext:" + ostr + "\r\n\r\n");
        showInfo(">>ciphertext:" + check + "\r\n\r\n");
        showInfo(">>verify signature:" + result + "\r\n\r\n");
        if(!flag) {
                // error of signature verification
        }
    }
```

3.1.5 NetpayClient for PHP Function Description

3.1.5.1 File List

Name	Path	Usage
netpayclinet.php	Installed in the corresponding pathaccording to the need of user	To provide the method of deploying digital signature
MerPrk.key	Unspecified, but needed to deploy function appointed file path and file name	Merchant's private key
PgPubk.key	Unspecified, but needed to deploy function appointed file path and file name	ChinaPay's public key

3.1.5.2 Method Description

- **Function buildKey**-to build public key/private key

Function Description:

function buildKey ($keyfile)

Function:

To build public key/private key for generating signature or verifying digital signature

Parameter Description:

$keyfile: file path of public/private key(including file name) e.g. "d:\\MerPrk.key",support relative path

Return Value:
If build successfully, return 15 bytes merchant id, else is false

- **Function signOrder**-to generate digital signature

Function Description:
function signOrder($merid, $ordno, $amount, $curyid, $transdate, $transtype)

Function:
To generate digital signature for inputted parameters

Parameters Description:
$merid – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay.
$ordno – order number. It is specified as a 16-byte long numeric string that is generated by the merchant's system, and previously failed transactions could be paid again.
$amount – transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string "000000001234" represents 12.34RMB or 12.34USD in this case. NOTE: If the value of curyid is JPY, the last two numbers of amount's value should be "00".
$curyid – the type of the currency used. It is a string containing 3 bytes. For example,"156"represents RMB,"JPY" represents Japanese yen, "USD" represents U.S. dollar.
$transdate – the date of the transaction. This numeric string is defined with the length of 8 to represent the transaction date with the format of YYYYMMDD.
$transtype –the transaction type. It is a string sized 4 and values between "0001" and "0002". Hereinto, "0001" represents payment transaction and "0002" refers to refund transaction.

Return Value:
NetPayClient generates a digital signature string with the length of 256 bytes using the input parameter values listed above. If the length of input parameter is invalid, the function return false.

- **Function verifyTransResponse**-to verify transaction response

Function Description:
function verifyTransResponse($merid, $ordid, $amount $curyid, $transdate, $transtype, $status, $checkvaluue)

Function:
To verify digital signature is right or not

Parameters Description:

$merid – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay.

$ordid – order number. It is specified as a 16-byte long numeric string that is generated by the merchant's system, and previously failed transactions could be paid again.

$amount – transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string "000000001234" represents 12.34RMB or 12.34USD in this case. NOTE: If the value of curyid is JPY, the last two numbers of amount's value should be "00".

$curyid – the type of the currency used. It is a string containing 3 bytes. For example,"156"represents RMB,"JPY" represents Japanese yen, "USD" represents U.S. dollar.

$transdate – the date of the transaction. This numeric string is defined with the length of 8 to represent the transaction date with the format of YYYYMMDD.

$transtype – the transaction type. It is a string sized 4 and values between "0001" and "0002". Hereinto, "0001" represents payment transaction and "0002" refers to refund transaction.

$status– the status of the transaction. It is specified as an array of numbers sized4. See the "transaction response code table" for details.

$checkvalue - check value. It is the digital signature value with 256 bytes generated by ChinaPay based on the transaction results.

Return Value:

true means that the method has been executed successfully. That is to say, it is ChinaPay who sends the result to the merchant. And the merchant will be responsible for the subsequent processing. All the other return values indicate the failure of the function and the results can be ignored or simply put into the "garbage bin".

- **Function sign**-to generate digital signature for a string

Function Description:

function sign ($msg)

Function:

To generate digital signature for inputted string of parameters.

Parameters Description:

$msg : is applied in the string for signature

Return Value:

NetPayClient generates a digital signature string with the length of 256 bytes using the input parameter values listed above.

- **Function verify**- to verify signature for a string

Function Description:

function verify ($plain, $checkvalue)

Function:
To verify the digital signature of target string

Parameters Description:
$plain - is applied in the string which generates digital signature
$checkvalue - Verification value, to verify signature of a 256-byte string
Return Value:
True: represents success, otherwise is failure

3.1.5.3 Sample Codes

(the following code is not verified and only for reference)

- **Sign Code**

```
<?php
include_once("netpayclient.php");

$merid = buildKey(“MerPrk.key”);
if(!$merid) {
        echo "导入私钥文件失败！ ";
        exit;
}

$ordid = "00" . date('YmdHis');
$transamt = padstr('1',12);
$curyid = "156";
$transdate = date('Ymd');
$transtype = "0001";
$version = "20070129";
$pagereturl = "$site_url/netpayclient_order_feedback.php";
$bgreturl = "$site_url/netpayclient_order_feedback.php";

$plain = $merid . $ordid . $transamt . $curyid . $transdate . $transtype . $priv1;
//sign for the order
$chkvalue = sign($merid, $ordid, $transamt, $curyid, $transdate, $transtype);
 //sign for a string
$chkvalue = sign($plain);
if (!$chkvalue) {
        echo "签名失败！ ";
        exit;
}
?>
```

- **Verify Signature Sample Code**

```
<?php
include_once("netpayclient.php");
```

```
        $flag = buildKey("PgPubk.key");
        if(!$flag) {
                echo "导入公钥文件失败！ ";
                exit;
        }

        $merid = $_REQUEST["merid"];
        $orderno = $_REQUEST["orderno"];
        $transdate = $_REQUEST["transdate"];
        $amount = $_REQUEST["amount"];
        $currencycode = $_REQUEST["currencycode"];
        $transtype = $_REQUEST["transtype"];
        $status = $_REQUEST["status"];
        $checkvalue = $_REQUEST["checkvalue"];
        $gateId = $_REQUEST["GateId"];
        $priv1 = $_REQUEST["Priv1"];

        $plain = $merid . $orderno . $amount . $currencycode . $transdate . $transtype . $status . $checkvalue;

        // verify signature of order
        $flag = verifyTransResponse($merid, $orderno, $amount, $currencycode, $transdate, $transtype, $status, $checkvalue);

        $flag = verify($plain, $checkvalue);
        if(!flag) {
                echo "<h2>验证签名失败！ </h2>";
                exit;
        }
    ?>
```

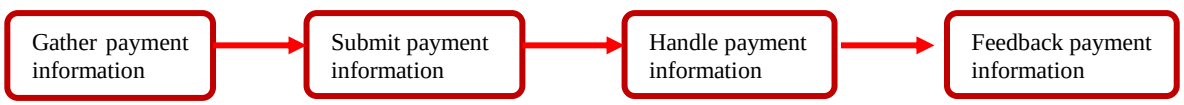
3.2 Payment （Version 20080515）

3.2.1 Payment Connecting URL

Merchant can connect with ChinaPay's online payment system by the means of WEB service. URL of receiving transaction data is:

Test Environment: http://payment-test.chinapay.com/pay/TransGet
Production Environment: https://payment.chinapay.com/pay/TransGet

3.2.2 Transaction Flow



3.2.3 Merchant>>>ChinaPay online payment

Sample Code: netpay_order_submit.jsp、 order_submit.asp、netpay_order_submit.php
Usage: receiving and encrypting the data sent by netpay_order.jsp, then send it to the gateway interface of ChinaPay's online electric payment platform. In this procedure, it mainly includes two parts: one is the content generated from submitted data, the other is the signature of generated content.

- **Content of Submitting Transaction Data**

<form action="https://payment.ChinaPay.com/pay/TransGet" METHOD=POST>（"action" here is the URL of submitting transaction data）
<input type=hidden name="MerId" value="808080290000001"/>（MerId is the Merchant ID assigned by ChinaPay, length of 15 bytes, necessary）
<input type=hidden name="OrdId" value="0000000000000006"/>（Order ID merchants submits to ChinaPay, length of 16 bytes, necessary）
<input type=hidden name="TransAmt" value="000000001234"/>（Order transaction amount, with 2 decimal,length of 12 bytes, add 0 from the left if inadequate, necessary）
<input type=hidden name="CuryId" value="156"/>（Order transaction currency, length of 3 bytes, for example,"156"represents RMB,"JPY" represents Japanese yen, "USD" represents U.S. dollar, necessary）
<input type=hidden name="CountryId" value="0086"/>（Country code,4bytes，telephone number code, necessary）
<input type=hidden name="TransDate" value="20080601"/>（Order transaction date, length of 8 bytes, necessary）
<input type=hidden name="TransType" value="0001"/>（Transaction type, length of 4 bytes, necessary）
<input type=hidden name="Version" value="20080515"/>（payment connection version, necessary）
<input type=hidden name="BgRetUrl" value="http://www.example.com/pay/Bgreturn.jsp"/>（URL of receiving background transactions, within 80 bytes, necessary）
<input type=hidden name="PageRetUrl" value="www. example.com/pay/Pgreturn.jsp"/>（URL of receiving page transaction, within 80 bytes, necessary）
<input type=hidden name="GateId" value="">（Payment gateway number, optional）
<input type=hidden name="Priv1" value="Memo">（Merchant private field, within 60 bytes）
<input type=hidden name="TimeZone" value="+06">（Eastern time zone is "+", western time zone is "-" ,3bytes, necessary）
<input type=hidden name="TransTime" value="122340">（transaction submit time, 6 bytes, necessary）
<input type=hidden name="DSTFlag" value="1">（flag of summer time , 1 represents summer time, 0 represents no, necessary）
<input type=hidden name="ExtFlag" value="00">（flag of overseas merchant, the default value is 00, necessary）

<input type=hidden name="Priv2" value="priv2">（Merchant private field 2, within 200 bytes, optional）
<input type=hidden name="ChkValue" value="X…X">（ASCII Code with 256 bytes, sign for the key data of this transaction, necessary）
</form>

Note:

TransAmt: Order transaction amount, the last two bytes represent decimal, e.g. 000000000123 represents 1.23 monetary unit.

PageRetUrl: URL of receiving page transactions, guides users to return to merchant webpage after payment.

BgRetUrl: URL of receiving background transactions, for merchants to record transaction information and settlement, not visible for users. According to the return code of http, ChinaPay decides whether to repeat sending. Background responses reference number to assure receipt of background response.

Priv1: Merchant's private field, join digital signature in payment of version 20080515, ChinaPay fulfills the same content that merchants send to ChinaPay in this field, and returns to merchants.

GateId: Optional, means payment gateway number, if it is GateId（payment gateway number）,users directly enter payment webpage, if not, users enter gateway selection webpage.

OrdId: means order id, it can be defined by merchants.

- **Sample Codes of Signature**

  NetPayClient for Java : **Sign** (refer to chapter3.1.1)
  NetPayClient for Win32 : **signData** (refer to chapter 3.1.2)
  NetPayClient for C : **signData** (refer to chapter 3.1.3)
  NetPayClient for C# : **Sign** (refer to chapter 3.1.4)
  NetPayClient for PHP : **sign** (refer to chapter 3.1.5)

Note:

For Version 20080515, digital signature should use "Function Sign - to generate digital signature for a string", and the strings should be linked by the following order:

MerId	OrdId	TransAmt	CuryId	TransDate	TransTime	TransType	CountryId	TimeZone	DSTFlag	ExtFlag	Priv1

3.2.4 ChinaPay online payment>>>Merchant(Page Return)

Sample Code: netpay_order_callback.jsp 、netpay_order_callback.php
Useage: After the payment has been finished, ChinaPay will send transaction response to merchant via client's page link. This step of procedure mainly include two parts:
Page receiving URL and background receiving URL will both receive transaction data including the following fields. Take page FORM data for example.

- **Information Format**

ChinaPay will send transaction response to merchant when the payment has been finished. Page receiving URL and background receiving URL will both receive transaction data including the following fields. Take page FORM data for example.

```
<form name="SendToMer" method="post"          action=""> （"action" here is the
                                        URL of submitting transaction data）
<input type="hidden" name="merid"       value="808080290000001"/>
<input type="hidden" name="orderno"     value="0000000010096806"/>
<input type="hidden" name="transdate"   value="20080601"/>
<input type="hidden" name="amount"      value="000000001234"/>
<input type="hidden" name="currencycode"   value="USD"/>
<input type="hidden" name="transtype"     value="0001"/>
<input type="hidden" name="status"        value="1001"/>
<input type="hidden" name="checkvalue"    value=" X...X "/>
<input type="hidden" name="GateId"        value=""/>
<input type="hidden" name="Priv1"         value=" Memo"/>
</form>
```

- **Verifying Signature of Response Data**

After payment transaction is finished, ChinaPay will send result information to merchant, which can be received by both page receiving URL and background receiving URL. Merchant should verify its signature to confirm whether this response is sent by ChinaPay. To different versions of NetPayClient, the realize codes of verifying signature of response data are different. They are showed as follows:

NetPayClient for Java : **verifyTransResponse** (refer to Chapter 3.1.1)
NetPayClient for Win32 : **check** (refer to Chapter 3.1.2)
NetPayClient for C : **verifyTransResponse** (refer to Chapter 3.1.3)
NetPayClient for C# : **verifyTransResponse** (refer to Chapter 3.1.4)
NetPayClient for PHP : **verifyTransResponse** (refer to chapter 3.1.5)

3.2.5 ChinaPay online payment>>>Merchant(Server Return)

Sample Code: netpay_order_feedback.jsp、netpay_order_callback.php
Useage: After the payment has been finished, ChinaPay will send transaction response to merchant from ChinaPay online payment server.

- **Information Format**

ChinaPay will send transaction response to merchant when the payment has been finished. Page receiving URL will receive transaction data. (Take page FORM data for example.)

```
<form name="SendToMer" method="post"  action="">  （”action” here is the URL of submitting transaction data）
<input type="hidden" name="merid"       value="808080290000001"/>
<input type="hidden" name="orderno"     value="0000000010096806"/>
<input type="hidden" name="transdate"   value="20080601"/>
<input type="hidden" name="amount"      value="000000001234"/>
<input type="hidden" name="currencycode"   value="USD"/>
<input type="hidden" name="transtype"     value="0001"/>
<input type="hidden" name="status"         value="1001"/>
<input type="hidden" name="checkvalue"    value=" X…X "/>
<input type="hidden" name="GateId"        value=" 0001"/>
<input type="hidden" name="Priv1"         value=" Memo"/>
</form>
```

- **Verifying Signature of Response Data**

After payment transaction is finished, ChinaPay will send result information to merchant, which can be received by both page receiving URL and background receiving URL. Merchant should verify its signature to confirm whether this response is sent by ChinaPay. To different versions of NetPayClient, the realize codes of verifying signature of response data are different. They are showed as follows:

NetPayClient for Java : **verifyTransResponse** (refer to Chapter 3.1.1)
NetPayClient for Win32 : **check** (refer to Chapter 3.1.2)
NetPayClient for C : **verifyTransResponse** (refer to Chapter 3.1.3)
NetPayClient for C# : **verifyTransResponse** (refer to Chapter 3.1.4)
NetPayClient for PHP : **verifyTransResponse** (refer to chapter 3.1.5)

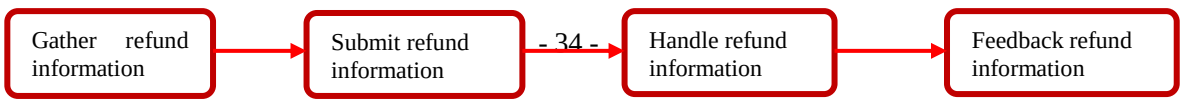
3.3 Refund(Version 20070129)

3.3.1 Connecting URL

Merchant can connect with ChinaPay’s refund system by the means of WEB service. URL of receiving transaction data is:

Test Environment: http://payment-test.chinapay.com/refund1/SingleRefund.jsp
Production Environment: https://console.chinapay.com/refund/SingleRefund.jsp

3.3.2 Transaction Flow



3.3.3 Merchant>>>ChinaPay online single refund

Sample Code： netpay_refund_submit.jsp、netpay_refund_submit.php
Usage: Receiving and encrypting the data sent by netpay_refund.jsp, then send it to ChinaPay's URL of receiving transaction data. In this procedure, it mainly include two parts: one is the content of single refund generated from submitted data, the other is the signature of generated content. Special codes are as follows.

- **Content of Submitting Single Refund Data**

<form action="https://console.chinapay.com/refund/SingleRefund.jsp" METHOD=POST> ("action" here is the URL of submitting refund data)
<input type=hidden name="MerID " value="808080290000001"> (MerId is the Merchant ID assigned by ChinaPay, length of 15 bytes, necessary)
<input type=hidden name="TransType" value="0002"> (Transaction Type: 0002 represents refund request, necessary)
<input type=hidden name="OrderId" value="0000000010096806"> (Original order ID, length of 16 bytes, necessary)
<input type=hidden name="RefundAmount " value="000000001234"> (Refund amount, with 2 decimal, length of 12 bytes, add 0 from the left if inadequate, necessary)
<input type=hidden name="TransDate" value="20070801"> (Original transaction date, length of 8 bytes, necessary)
<input type=hidden name="Version" value="20070129"> (Version of single refund, necessary)
<input type=hidden name=" ReturnURL " value="http://www. example.com/back1.jsp"> (URL of receiving refund status, optional, within 100 bytes)
<input type=hidden name="Priv1" value=" "> (Merchant private field, necessary, within 40 bytes)
<input type=hidden name="ChkValue" value="X…X"> (ASCII code of 256 bytes, necessary)
</form>

Statement:

TransType-transaction type. 0002 represents refund request, which will be rejected if refund amount is greater than original order's amount.

ReturnURL is response of refund request, whose content is optional. If merchant needs to be informed when the refund status changes, this filed should be filled in.

Priv1 is merchant private field, necessary, whose data is defined by merchant but should not be repeated. In order to avoid submitting refund request for several times, data in this field will be verified if it is repeated. If the refund request has been submitted before, it is considered that it has been received and will not be processed again.

- **Digital Signature of Transaction Data**

Digital signature is required when Merchant sends transaction data to ChinaPay. For Version 20040916, signature data should use "Function Sign - to generate digital signature for a string". Names of functions are:

NetPayClient for Java	:	**Sign** (refer to Chapter 3.1.1)
NetPayClient for Win32	:	**signData**(refer to Chapter 3.1.2)
NetPayClient for C	:	**signData** (refer to Chapter 3.1.3)
NetPayClient for C#	:	**Sign** (refer to Chapter 3.1.4)
NetPayClient for PHP	:	**sign** (refer to chapter 3.1.5)

Statement:

For Version 20070129, digital signature of refund transaction should use "Function Sign - to generate digital signature for a string", and the strings should be linked by the following order:

- | MerID | TransDate | TransType | OrderId | RefundAmount | Priv1 |

3.3.4 ChinaPay online single refund >>> Merchant (Server Return)

Sample Code: netpay_refund_callback.jsp、netpay_refund_callback.php

Useage: ChinaPay's server program will return "refund request received" response to merchant after processing refund request. When the status of particular refund changed into success or failure, corresponding response will also be sent to merchant. In this procedure, it mainly includes two parts: one is the content of single refund generated from submitted data, the other is the verification of returned query information. Special codes are as follows.

- **Format of "success" response:**

```
ResponseCode=value0&MerID=value1&ProcessDate=value2&SendTime=value9&TransType=value3&OrderId=value4&RefundAmount=value5&Status=value6&Priv1=value7&CheckValue=value8
```

- **Format of "failure" response:**

```
ResponseCode=value0&Message=message_string
```

Statement:

Merchant can judge whether the refund is successful via ResponseCode. ResponseCode value of 0 represents successful refund while other Response codes mean failed refund. (Refer to Appendix B, the chapter of error code of single refund)

Definition of each field in "success" response:

ResponseCode : Response code, value is 0

MerID： Merchant ID, 15 bytes figure

ProcessDate: ChinaPay's process date, 8 bytes figure

SendTime: Time of ChinaPay sending response, 6 bytes figure(hhmmss), this field is not in digital signature

TransType： Transaction type, 4 bytes figure

OrderId： Original order ID, 16 bytes figure

RefundAmount： Refund amount, 12 bytes figure

Status： Status of particular refund, 1 byte figure

1	Refund request submitted successfully
3	Refund succeed
8	Refund fail

Priv1: Merchant's private field, maximum 40 bytes

Checkvalue： Signature verification, 256 bytes

Definition of each field in "failure" response:

ResponseCode : Response code, 3 bytes figure
Message： Explanation of response code

- **Signature Verification of Response Data**

Response data will be sent to merchant when the refund request is successfully submitted or the refund status changes into success or failure. After receiving response data, merchant should verify the signature to confirm whether this data is sent by ChinaPay, using "Function check - to verify transaction response". Names of functions are:

NetPayClient for Java : **verifyAuthToken** (refer to Chapter 3.1.1)
NetPayClient for Win32 : **checkData** (refer to Chapter 3.1.2)
NetPayClient for C : **verifySignData** (refer to Chapter 3.1.3)
NetPayClient for C# : **erifyAuthToken** (refer to Chapter 3.1.4)
NetPayClient for PHP : **verify** (refer to Chapter 3.1.5)

Statement:

For Version 20070129, verifying digital signature of refund transaction should use ""Function check - to verify transaction response", and the strings should be linked by

the following order:

MerID	ProcessDate	TransType	OrderId	RefundAmount	Status	Priv1

3.4 Query (Single Query, Version 20080515)

3.4.1 Connecting URL

Merchant can connect with ChinaPay's system by the means of WEB service. URL of receiving transaction data is:

Test Environment: http://payment-test.chinapay.com/ QueryWeb/processQuery.jsp
Production Environment: https:// control.chinapay.com/QueryWeb/processQuery.jsp

In addition, as we add extra note that ChinaPay adopts the way of flow control to permit merchant accessing to, following conditions should be satisfied:

- Request will be responded only if it is submitted from IP address designated by merchant that has the right to inquire transaction, and the interval between two successful enquiries should be longer than the system's set interval. Otherwise system will report "illegal merchant request" (Error code 111).
- Transactions of failure status which are inquired in a fix time should not exceed some volume, otherwise system will report "over-flow control" (Error code 305).

Therefore, when merchant applies for single enquiry function, its server's IP address and Merchant ID should be provided.

3.4.2 Transaction Flow

3.4.3 Merchant>>>ChinaPay online Query

Sample Code: netpay_query.jsp、netpay_query.php
Usage: Receiving and encrypting the data sent by merchant, then send it to ChinaPay's URL of receiving transaction data. In this procedure, it mainly includes two parts: one is the content of query generated from submitted data, the other is the signature of generated content. Special codes are as follows.

- **Content Submitted on Single Enquiry Page**

<form action="http://control.chinapay.com/QueryWeb/processQuery.jsp" METHOD=POST> ("action" here is the URL of submitting enquiry data)
<input type=hidden name="MerId" value="808080290000001"> (MerId is the Merchant ID assigned by ChinaPay, length of 15 bytes, necessary)
<input type=hidden name="TransType" value="0001"> (Transaction Type: 0001

represents consumption transaction)

<input type=hidden name="OrdId" value="0000000010096806"> (Order ID, length of 16 bytes, necessary)

<input type=hidden name="TransDate" value="20070801"> (Transaction date of the particular order, length of 8 bytes, necessary)

<input type=hidden name="Version" value="20080515"> (Version of single enquiry, necessary)

<input type=hidden name="Resv" value=" "> (Merchant's reserve field)

<input type=hidden name="ChkValue" value="X…X"> (ASCII code of 256 bytes, necessary)

</form>

- **Digital Signature of Transaction Data**

Digital signature is required when Merchant sends transaction data to ChinaPay. For Version 20060831, signature data should use "Function Sign - to generate digital signature for a string". Names of functions are:

NetPayClient for Java : **Sign** (refer to Chapter 3.1.1)
NetPayClient for Win32 : **signData** (refer to Chapter 3.1.2)
NetPayClient for C : **signData** (refer to Chapter 3.1.3)
NetPayClient for C# : **Sign** (refer to Chapter 3.1.4)
NetPayClient for PHP : **sign** (refer to Chapter 3.1.5)

For Version 20080515, digital signature of query transaction should use "Function Sign - to generate digital signature for a string", and the strings should be linked by the following sequence:

MerID	TransDate	OrderId	TransType

3.4.4 ChinaPay online query >>> Merchant (Server Return)

Sample Code: netpay_query_result.jsp 、netpay_query_result.php
Useage: ChinaPay's server program will return response to merchant after processing query request. In this procedure, it mainly includes two parts: one is the format of returned information, the other is the signature of generated content. Special codes are as follows.

- **Format of "success" response:**

```
ResponeseCode=value1&merid=value2&orderno=value3&amount=value4&currencycode=value5&transdate=value6&transtype=value7&status=value8&checkvalue=value9&GateId= value10&Priv1= value11
```

- **Format of "failure" response:**

ResponeseCode=value0&Message=message_string

Note:
Merchant can judge whether the refund is successful via ResponseCode. ResponseCode value of 0 represents successful query while other Response codes mean failed query. (Refer to Appendix B, the chapter of error code of single refund)

Definition of each field in “success” response:

ResponeseCode: Response code, value is 0

merid： Merchant ID, 15 bytes figure

orderno： Enquiry Order ID, 16 bytes figure

amount： Transaction amount, 12 bytes figure

currencycode： Transaction currency, 3 bytes figure

transdate: Transaction date, 8 bytes figure

transtype： Transaction type, 4 bytes figure

status： Transaction status, 4 bytes figure

checkvalue： Digital signature, 256 bytes

GateId： Transaction gateway ID, 4 bytes

Priv1： Merchant private field

Definition of each field in “failure” response:

ResponeseCode: Response code, 3 bytes figure
Message： Explanation of response code

- **Signature Verification of Response Data**

ChinaPay will send the query information to merchant when completing query transaction, using “Function check - to verify transaction response”. Names of functions are:

NetPayClient for Java : **verifyTransResponse** (refer to Chapter 3.1.1)
NetPayClient for Win32 : **check** (refer to Chapter 3.1.2)
NetPayClient for C : **verifyTransResponse** (refer to Chapter 3.1.3)
NetPayClient for C# : **verifyTransResponse** (refer to Chapter 3.1.4)
NetPayClient for PHP : **verifyTransResponse** (refer to Chapter 3.1.4)

Appendix A Common Connection Problems and Solutions

1. **In the development process , reported 157 error code.**
   QA: Check to see if GATEID is 0001, if it is, delete 0001.

2. **After payment online, how to do, if click submit button, the page presents " Gateway Routing doesn't exsit"?**
   QA: Set GateId's value to empty, and then to submit the order to ChinaPay.

3. **After payment online, how to do, if click submit button, the page presents " The standard data field cannot be blank"?**
   QA:Merchant checks whether every piece of program is written according to <<NetPayClient_MerchantOperationManual>>. When come up with such report, it expresses program designer doesn't meet with the manual, there are some stupid mistakes such as spelling mistake, forgetting to put in important data and so on. Remind merchant to check the parameters as follows: MerId, OrdId, TransAmt, CuryId, TransDate, TransType and some relative programs.

   Typical case:
   One company's program's designer input:
   ……
   <input type=hidden name="cruyId" value="156">
   ……
   The correct one is:
   <input type=hidden name="curyId" value="156">. A word's error contributes to the difficult of data reading. That is, function can't find the important information included by curyId, which contributes to the report of "Standard data field can not be blank!"

4. **After payment online, how to do, if click submit button, the page presents " The merchant's code is empty"?**
   QA: This problem mainly happened in UPOP, as the MerId has not been configured the Id used in UPOP. Merchants need to contact the operation center (phone NO.: 021-61871399) to configure this information.

5. **How to deal with the problem that the system report 500 error code during merchant's testing process?**
   QA: This error is systematic error, which belongs to the error of compiling program. That is because merchant mixed test submit URL and official submit URL.
   Typical case:
   When compile programs , designer input:
   ……
   <form action=https://payment.chinapay.com/pay/TransGet method=post>
   ……
   This is test merchant, so the right content after action is http://payment-test.chinapay.com/, that is to say, the right input is:
   <form action=http://payment-test.chinapay.com/pay/TransGet method=post>。

6. **How to deal with the problem that merchant comes to illegal length?**

QA: Illegal length is because of merchant's wrong configuration that the length of parameters is not follow actual demands. For example, OrderId is not 16 bytes, TransDate is not 8 bytes, TransAmt is not 12 bytes, Checkvalue is not generated, and so on, all of which may cause illegal length.

The detail statement of sending parameters is as follows:

String MerId – merchant ID, It is defined as a string with the length of 15 bytes that is assigned by ChinaPay or the clearing bank when the merchant agrees to use the service provided by ChinaPay.

String OrdId – order number. It is specified as a 16-byte long numeric string that is generated by the merchant's system, and previously failed transactions could be paid again.

String TransAmt– transaction amount. This variable is defined as a numeric string and has the length of 12. For example, the string "000000001234" represents 12.34RMB , 12.34JPD or 12.34USD in this case.

String CuryId – the type of the currency used. It is a string containing 3 bytes. Currently, only the value "156" is accepted to represent RMB in the system.

String TransDate– the date of the transaction. This numeric string is defined with the length of 8 to represent the transaction date with the format of YYYYMMDD.

String TransType – the transaction type. It is a string sized 4 and values between "0001" and "0002". Hereinto, "0001" represents payment transaction and "0002" refers to refund transaction.

Return Value

String CheckValue - check value. It is the digital signature value with 256 bytes generated by ChinaPay based on the transaction results.

7. What's the problem that ERRORCODE=110?

QA: Background return URL or Page return URL is too long. The length of Background return URL can't over 80 bytes. If it is over 80 bytes ,the system will report 110 error code. Advice merchant alter Background return URL and Page return URL, limit the length within 80 bytes.

8. How to deal with the problem that AXTIVEX control can't create object or DLL is not registered during the development process of ASP?

QA:

a) Let merchant to check whether the SCRIPT of system XP has been updated to the latest version.

b) Let merchant to check whether lode CHINAPAY.DLL and CPNPC.DLL correctly, and put NETPAY.DLL on the SYSTEM32 folder.

9. What's the problem that system reports illegal page in the development process?

QA: Submit page should use popup windows. If merchant use frame interface, that the submission page will not redirect properly, that would report illegal page. Advising merchant to alter the structure of website, and to use popup windows instead of directing in the frame of page.

10. When sending transaction, some other error report information

status code	Transaction Description
1001	Purchase transaction succeeded
1003	Refund transaction succeeded
1005	Refund order cancel succeeded
others	All the other response codes refer to a failed transaction. Please check the detailed description from ChinaPay's Merchant Management System or error information files of banks

11. During the system testing, successful payment but occur verifying signature mistake when return to merchant website page.

QA: Firstly, the program developing must keep accord to the content of << NetPayClient User Manual>>. Meanwhile, you should care when accepting the response, the signature method of version 20070129 and version 20040916 are identical. Please pay especial attention to this.

Typical Example:

One company's programmer input following content when testing company:

……

Chkvalue = request.getparameter("chkvalue")

……

Because the sending parameter's name is"ChkValue", when feedback fetch the "ChkValue" too. In fact, this parameter should be "checkvalue", so the transmit parameter value is null, and results to failure of verifying signature. That is to say:

Chkvalue = request.getparameter("checkvalue")

This mistake as a result of the merchant didn't code the program according to << NetPayClient User Manual >>.

12. What should we do when the failure of initializing public key occurs?

QA: If merchants develop their program in JAVA, please check that whether merchants have input the public key number instead of merchant ID.

Typical Example:

One company's programmer input following content when testing company:

……

Flag=key.buildKey("808080002100999",0"c:\winnt\PgPubk.key");

……

But, the correct code should like this:

……

Flag=key.buildKey("999999999999999",0"c:\winnt\PgPubk.key");

……

13. What we should do when the -118 mistake occurs?

QA: Generally speaking, this mistake does not occur frequently. It is mainly because the merchant use the incorrect private key or transmit the wrong parameters to verifying signature method which lead to verify signature error. For example, the testing merchant use the producing merchant's private key or signature method lead to incorrectly parameter transmitting and verifying signature failure.

Typical Example:

One merchant use producing public key when test testing online system, result to -118 mistake, after modified to testing merchant public key the error removed.

14. What about can't receive the background answer?

QA: Checking that whether the response acceptance code have something wrong with the judgment which responsible for judging the qualification of accepting response; and ensure the correct accepting response URL when sending transaction.

15. How to inform ChinaPay when accept background response successfully?

QA: WEBSEVER feedback automatically, generally, successfully acceptance will return number 200 automatically, so merchant don't need any parameter. Only when the value of OrderStatus is "1001" means successful transaction, the rest values all mean failing transaction. And merchant need to judge this then adds to own database.

16. What about the failure of loadlib(CHINAPAY.DLL)?

QA: Netpay.dll must be put in the system32 folder.

Appendix B The Instructions for Payment Interfaces

1. Response for payment results from ChinaPay

BgRetUrl: URL of receiving background transactions, necessary. It is used to receive the payment results sent by ChinaPay when cardholders didn't return to merchant's website after paying successfully on the online banking page. **The address is suggested to use the ip address instead of domain name, and external network must be able to access, while can't fill any parameters.** Otherwise, it'll affect merchants receiving ChinaPay's background response. If merchants need to transfer parameters, they could make full use of Priv1, whose length is limited to 60 bytes. **Before putting the payment interface into operation formally, merchants must test whether the BgRetUrl can normally receive ChinaPay's response.**

After receiving ChinaPay's payment results, merchant should firstly verify its signature. If it's ok, then judge whether the value of status equals "1001". Only "1001" means success while other codes mean has not been success yet..

ChinaPay has two payment results notifications, and the background response has retransmission mechanism, so merchants' system must judge whether the order is repeatable before modifying the order's status in merchants' database.

2. Priv1: Merchant private field

ChinaPay fulfills the same content that merchants send to ChinaPay in this field, and returns to merchants. In the version of 20070129, this field does not support Chinese and special characters, which will affect the signature. So the merchants must limit the input type of this field, and prevent the cardholders inputting Chinese characters or other special characters.

3. Merchant web page tips

- Suggest cardholders use IE browser;
- Suggest cardholders following the page prompts jump back to the merchant site after paying successfully on the online banking page so as to ensure the merchant's

system receiving payment results in time ;

- Suggest cardholders finish payment operation after ordering as soon as possible.

4. Merchant change tips

If there are changes in merchant's server, here are a couple of things to be aware:

1) If the domain name changes, merchants need to consider updating the following information:

- PageRetUrl and BgRetUrl in payment interface;
- Notification addresses in settlement reconciliation and settlement account interfaces. Merchants should contact the operation center (phone NO.: 021-61871399) to bind new addresses, which will take effect in the next day.

2) If IP address changes, merchants need to consider updating the following information:

- PageRetUrl and BgRetUrl in payment interface;
- Ip addresses bound in ChinaPay where merchants launch single query request in single query interface. Merchants should contact the operation center (phone NO.: 021-61871399) to bind new ip addresses, which will take effect in the next day.
- Notification addresses in settlement reconciliation and settlement account interfaces. Merchants should contact the operation center (phone NO.: 021-61871399) to bind new addresses, which will take effect in the next day.

Appendix C Response Code Description

1. ChinaPay transaction status code

Form 3 ChinaPay transaction status code

status code	Transaction Description
1001	Purchase transaction succeeded
1003	Refund transaction succeeded
1005	Refund order cancel succeeded
others	All the other response codes refer to a failed transaction. Please check the detailed description from ChinaPay's Merchant Management System or error information files of banks

2. NetPayClient API Error Codes

Form 4 NetPayClient API Error Codes

status code	Status Information
All methods	
-111	Private key path is not set, or NPCDIR environment variable is not set
Signature methods	
-100	NPCDIR environment variable is not set
-101	Merchant private key file does not exist or can't be opened
-102	private key file format error
-103	private key merchant id is not compatible with signature merchant id
-109	Checking the merchant's signature failure
-130	Length of string for signature is blank
Signature verification methods	

-112	ChinaPay public key file does not exist or can't be opened
-113	Public key file format error
-114	Public key file error
-118	Signature verification failure
-134	Public key file path set error

3. Query, Single Refund Error Codes

ERROR CODE	ERROR MESSAGE
101	Merchant id error or is blank
102	Order number of transaction response inquiry is blank
103	Transaction date is blank
104	Request transaction type error
105	Merchant id length error
106	Order number length error
107	Transaction date length error
108	Transaction type is blank or length error
109	Version number is blank
110	Version number error
111	Merchant request forbidden
112	Transaction type error
116	Amount is blank
117	Merchant private field length error
118	Signature field error
120	Accumulated refund amount is over original payment amount
121	Refund amount does not equal to original order amount
122	Refund amount should be less than original order amount
123	Total refund amount is more than original order amount
201	Plaintext data is blank
201	Signature data does not exist
202	Signature error
203	Signature verification failure
204	Signature verification data error

205	Repeat submitting the transaction
301	Inquired transaction does not exist
302	Inquiry database error
303	Response data package error
304	Response data string transformation error
305	Exceed volume control range
307	Corresponding data is not found
402	Original transaction doesn't exist. The transaction date in the refund request should be the date when the payment transaction happened.
404	Other internal errors

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