**System Requirement for IPN Network**

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# **System components**

* 1. Clients
  2. Tech provider (Tech-Hub pay)
  3. Central bank of Egypt (CBE)
  4. Banks

# **scop of roles**

## Clients

Is responsible for providing the user interface to the user and consume the APIs provided by the tech provider to enable user to use the IPN network in their transaction, and will manage the user login.

## Tech provider (Tech-Hub pay)

Is responsible for handling transaction in the IPN network, It give the user IPA (internet payment address) to deal with network and make transactions instantly. It is responsible for route transactions between banks and provide a daily report to the CBE.

## Central bank of Egypt (CBE)

It is responsible for setting the rules governing the IPN network, provide a list of banks that are registered in the IPN network, and provides statistics on transactions within the network.

## Banks

It is responsible for manage it users bank account within the network, it completes withdrawals and deposits made by users that use the network.

# **Scenarios**

⚠️First there will be a client ID (credential) for each client that will use our service.

## Registration

The **client** will provide and send the following information to the **Tech provider** (Tech-Hub Pay):

* The new user **IPA**
* Bank id
* Card number
* ATM PIN
* IPA-PIN (security wise to use it later in transactions)

**Tech-Hub Pay** will receive this information and will perform the following operation:

* Validate the new IPA and make sure that this new IPA is unique
* Validate that the **Bank** is registered in the IPN network (the registered **banks** will be provided by the **CBE**)
* Will generate a new unique **account key** to refer to the new added the bank account (it will be saved on the bank for later communication).

**Tech-Hub pay** will provide and send the following information to the **Bank**:

* The new generated **Account key**
* Card number
* ATM PIN
* IPA-PIN

The **Bank** will receive this information and will perform the following operation:

* Validate that the bank account is exist and the ATM PIN is valid
* If the above information is valid the bank will save the generated **account key** and the **IPA-PIN** and the generated account key will be the reference to the bank account and will be saved permanent in the Tech-Hub Pay database and will respond to the Tech-Hub Pay by the account key and that is confirmed.
* If the information is not valid the bank will respond to Tech-Hub Pay that the data is not valid with the reason, The generated key will be removed from the Tech-Hub Pay too.

⚠️the generated key will be saved temporary in the Tech-Hub Pay until the bank response, if the bank did not respond before a period of time the generated key will be removed.

## Add account

The **client** will provide and send the following information to the **Tech provider** (Tech-Hub Pay):

* The user **IPA**
* Bank id
* Card number
* ATM PIN
* IPA-PIN

**Tech-Hub Pay** will receive this information and will perform the following operation:

* Validate that the user IPA is exist
* Validate that the **Bank** is registered in the IPN network
* Will generate a new unique **account key** to refer to the new added the bank account

**Tech-Hub pay** will provide and send the following information to the **Bank**:

* The new generated **Account key**
* Card number
* ATM PIN
* IPA-PIN

The **Bank** will receive this information and will perform the following operation:

* Validate that the bank account is exist and the ATM PIN is valid
* If the above information is valid the bank will save the generated **account key** and the **IPA-PIN** and the generated account key will be the reference to the bank account and will be saved permanent in the Tech-Hub Pay database and will respond to the Tech-Hub Pay by the account key and that is confirmed.
* If the information is not valid the bank will respond to Tech-Hub Pay that the data is not valid with the reason.
* The generated key will be removed from the Tech-Hub Pay too.

## Send Transaction

### Bank account to IPA

The **client** will provide and send the following information to the **Tech provider** (Tech-Hub Pay):

* + Sender Bank Account key
  + Receiver IPA
  + amount
  + IPA-PIN

**Tech-Hub Pay** will receive this information and will perform the following operation:

* Validate that the receiver IPA and get his default bank account key and its bank id
* Validate the sender bank account key and get its bank id
* Generate transaction ID

**Tech-Hub pay** will provide and send the following information to the **Issuer** **Bank**:

* Transaction ID
* Sender bank account key
* Amount
* IPA-PIN

**The Issuer Bank** will receive this information and will perform the following operation:

* Validate the sender account key
* Validate the sender IPA-PIN
* Check if the amount is available
* Hold the amount

**The Issuer Bank** will provide and send the following information to the **Tech-Hub Pay**:

* Transaction ID
* Transaction Status (is valid or not)

**Tech-Hub pay** will provide and send the following information to the **Acquire** **Bank**:

* Transaction ID
* Receiver bank account key

**The Acquire Bank** will receive this information and will perform the following operation:

* Validate the sender account key

**The Acquire Bank** will provide and send the following information to the **Tech-Hub Pay**:

* Transaction ID
* Transaction Status (is valid or not)

**Tech-Hub Pay** will receive this information from the **issuer bank** and the **acquire bank** and will perform the following operation:

* If the **issuer bank** and the **acquire bank** validate the transaction, Tech-Hub Pay will send confirm transaction to the both banks
* If one of the banks did not validate the transaction, Tech-Hub Pay will send cancel transaction to the two banks
* Notify the client with the transaction ID and the status
* Save the transaction in the logs

⚠️if one of the two banks did not respond after a specific period of time the transaction will be canceled

### Bank account to Wallet

The **client** will provide and send the following information to the **Tech provider** (Tech-Hub Pay):

* + Sender Bank Account key
  + Receiver wallet number
  + amount
  + IPA-PIN

**Tech-Hub Pay** will receive this information and will perform the following operation:

* Map the wallet number to accessioned bank and get its bank id
* Validate the sender bank account key and get its bank id
* Generate transaction ID

**Tech-Hub pay** will provide and send the following information to the **Issuer** **Bank**:

* Transaction ID
* Sender bank account key
* Amount
* IPA-PIN

**The Issuer Bank** will receive this information and will perform the following operation:

* Validate the sender account key
* Validate the sender IPA-PIN
* Check if the amount is available
* Hold the amount

**The Issuer Bank** will provide and send the following information to the **Tech-Hub Pay**:

* Transaction ID
* Transaction Status (is valid or not)

**Tech-Hub pay** will provide and send the following information to the **Acquire** **Bank**:

* Transaction ID
* Receiver bank account key

**The Acquire Bank** will receive this information and will perform the following operation:

* Validate the sender account key

**The Acquire Bank** will provide and send the following information to the **Tech-Hub Pay**:

* Transaction ID
* Transaction Status (is valid or not)

**Tech-Hub Pay** will receive this information from the **issuer bank** and the **acquire bank** and will perform the following operation:

* If the **issuer bank** and the **acquire bank** validate the transaction, Tech-Hub Pay will send confirm transaction to the both banks
* If one of the banks did not validate the transaction, Tech-Hub Pay will send cancel transaction to the two banks
* Notify the client with the transaction ID and the status
* Save the transaction in the logs

⚠️if one of the two banks did not respond after a specific period of time the transaction will be canceled

### Bank account to IBAN/Account Number

The **client** will provide and send the following information to the **Tech provider** (Tech-Hub Pay):

* + Sender Bank Account key
  + Receiver IBAN/Account Number
  + amount
  + IPA-PIN

**Tech-Hub Pay** will receive this information and will perform the following operation:

* Validate that the receiver IBAN/Account Number and get his default bank account key and its bank id
* Validate the sender bank account key and get its bank id
* Generate transaction ID

**Tech-Hub pay** will provide and send the following information to the **Issuer** **Bank**:

* Transaction ID
* Sender bank account key
* Amount
* IPA-PIN

**The Issuer Bank** will receive this information and will perform the following operation:

* Validate the sender account key
* Validate the sender IPA-PIN
* Check if the amount is available
* Hold the amount

**The Issuer Bank** will provide and send the following information to the **Tech-Hub Pay**:

* Transaction ID
* Transaction Status (is valid or not)

**Tech-Hub pay** will provide and send the following information to the **Acquire** **Bank**:

* Transaction ID
* Receiver bank account key

**The Acquire Bank** will receive this information and will perform the following operation:

* Validate the sender account key

**The Acquire Bank** will provide and send the following information to the **Tech-Hub Pay**:

* Transaction ID
* Transaction Status (is valid or not)

**Tech-Hub Pay** will receive this information from the **issuer bank** and the **acquire bank** and will perform the following operation:

* If the **issuer bank** and the **acquire bank** validate the transaction, Tech-Hub Pay will send confirm transaction to the both banks
* If one of the banks did not validate the transaction, Tech-Hub Pay will send cancel transaction to the two banks
* Notify the client with the transaction ID and the status
* Save the transaction in the logs

⚠️if one of the two banks did not respond after a specific period of time the transaction will be canceled

## Request Money

The **client** will provide and send the following information to the **Tech provider** (Tech-Hub Pay):

* + Request from **IPA** (the one who will receive the notification to accept or reject)
  + Sender bank account key
  + Amount needed

**Tech-Hub pay** will receive this information and will perform the following operation:

* + Validate request from IPA
  + Notify the receiver by the request to approve or not
  + If approved client will initialize a **Send transaction** process
  + If not approved will notify the sender that receiver reject the request

## Get Balance

The **client** will provide and send the following information to the **Tech provider** (Tech-Hub Pay):

* + The user **IPA**
  + Bank account key
  + IPA-PIN

**Tech-Hub pay** will receive this information and will perform the following operation:

* + Validate IPA
  + Validate that this bank account key is assigned to this IPA

**Tech-Hub pay** will provide and send the following information to the **Bank**:

* Bank Account key
* IPA-PIN

**The Bank** will receive this information and will perform the following operation:

* Validate the account key
* Validate IPA-PIN

**The Bank** will provide and send the following information to **Tech-Hub Pay**:

* Bank Account key
* Balance

**Tech-Hub Pay** will provide and send the following information to **the client**:

* IPA
* Bank Account key
* Balance

⚠️If I do not receive any response after a specific period of time the process will be canceled

## Logs

**Tech-Hub pay** will save all transactions on a database until the **CBE** requests the transactions logs**.**