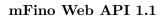
mFino Web API

mFino Technical Team

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1 Introduction

The scope of this document is to provide the technical design specifications of an Application Program Interface (API) to mFino's Mobile Financial Services (MFS) platform, mWallet. We shall call this the **mFino Web API** henceforth. This document will also provide details on the integration aspects for clients to consume this API.

The purpose of this document is to be enable external applications to integrate with the mWallet platform. mFino Web API is language independent, stateless, web based and uses standard request response format. The three main parts of the API are as follows:

- 1. Authentication
- 2. Request format
- 3. Response format

1.1 Authentication

mFino Web API will use basic access authentication (http://en.wikipedia.org/wiki/Basic_access_authentication) for governing access to the API. Only authenticated clients will be able to access the WebAPI. Since this is a stateless API, every request has to be authenticated. The conversational state has to be maintained by the client through additional paramaters provided in the API wherever required.

1.2 Request Format

The communication between the client and the API (request) should adhere to the following:

- Http protocol will be used for communication.
- Http request type: POST
- For every HTTP request, mFino WebAPI will reply with an XML document as the response.
- The standard set of parameters to be used in the request are described in Table 1. The exact parameters to be used for each function are described in later sections.



• The request parameters have to be in URL encoded form conforming to the standard internet mime type application/x-www-form-urlencoded. The parameters and values form key value pairs with = separating the the value from the key and ampersand (&) separating the key value pairs.

Example:

serviceName=activation&sourceMDN=621234567890&sourcePIN=123456&amount=12000&destMDN=629876543210&mode=subscriber

• mFino WebAPI expects the client to have the capability of parsing and sending the transferID and/or parentTxnID to enable the WebAPI to maintain the client's state across API calls.

1.3 Response Format

mFino WebAPI's response to a client request will adhere to the following:

- mFino WebAPI always sends response in XML format.
- Client should be able to handle standard http response codes in addition to mfino WebAPI server response

The response XML will conform to the below XML Schema.

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"</pre>
targetNamespace="http://www.w3schools.com" xmlns="http://www.w3schools.com"
elementFormDefault="qualified">
<xs:element name="response">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="message">
        <xs:complexType>
          <xs:simpleContent>
            <xs:extension base="xs:string">
              <xs:attribute name="code" type="xs:integer" />
            </xs:extension>
          </xs:simpleContent>
        </rs:complexType>
      </xs:element>
```



```
<xs:element name="balanceDetail" minOccurs="0">
  <xs:complexType>
    <xs:sequence>
        <xs:element name="commodityType" type="xs:string"</pre>
             maxOccurs="1" minOccurs="1"/>
        <xs:element name="balance" type="xs:string"</pre>
             maxOccurs="1" minOccurs="1"/>
        <xs:element name="transactionTime" type="xs:dateTime"</pre>
             maxOccurs="1" minOccurs="1"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="transactionDetails" minOccurs="0">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="transactionDetail">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="refID" type="xs:string"</pre>
                  maxOccurs="1" minOccurs="1"/>
            <xs:element name="commodityType" type="xs:string"</pre>
                  maxOccurs="1" minOccurs="1"/>
            <xs:element name="sourceMDN" type="xs:string"</pre>
                  maxOccurs="1" minOccurs="1"/>
            <xs:element name="destMDN" type="xs:string"</pre>
                  maxOccurs="1" minOccurs="1"/>
            <xs:element name="transactionType" type="xs:string"</pre>
                  maxOccurs="1" minOccurs="1"/>
            <xs:element name="transactionTime" type="xs:string"</pre>
                  maxOccurs="1" minOccurs="1"/>
            <xs:element name="amount" type="xs:string"</pre>
                  maxOccurs="1" minOccurs="1"/>
            <xs:element name="transferStatus" type="xs:string"</pre>
                  maxOccurs="1" minOccurs="0"/>
            <xs:element name="transferType" type="xs:string"</pre>
                  maxOccurs="1" minOccurs="0"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
```



```
</xs:complexType>
      </xs:element>
     <xs:element name="refID" type="xs:integer"</pre>
            maxOccurs="1" minOccurs="0"/>
     <xs:element name="parentTxnID" type="xs:string"</pre>
            maxOccurs="1" minOccurs="0"/>
     <xs:element name="transferID" type="xs:string"</pre>
            maxOccurs="1" minOccurs="0"/>
     <xs:element name="transactionTime" type="xs:string"</pre>
            maxOccurs="1" minOccurs="0"/>
     <xs:element name="sourceRefID" type="xs:integer"</pre>
            maxOccurs="1" minOccurs="0"/>
     <xs:element name="lastBalanceAfterTransaction" type="xs:integer"</pre>
            maxOccurs="1" minOccurs="0"/>
   </xs:sequence>
  </xs:complexType>
</xs:element>
</xs:schema>
```



PARAMETER	DESCRIPTION
serviceName	Name of the function. See Table 2
sourceMDN	Incoming MDN (to be captured from the incoming
	message by the invoker)
sourcePIN	MPIN entered by the subscriber/merchant invoking
	the request
secretAnswer	Secret answer entered by the subscriber invoking the
	request
contactNumber	Contact number that will be given as input by sub-
	scriber
destMDN	Destination MDN entered by the subscriber/merchant
newPIN	During change PIN, this will be the new PIN entered
	by the user
oldPIN	During change PIN, this will be the existing PIN en-
	tered by the user
amount	Transaction amount entered by the mer-
	chant/subscriber
bucketType	Selection made by subscriber. See Table 3
cardPANSuffix	The last 6 (configurable) digits of the Card PAN. Used
	for activating the bank account
channelID	Channel from which the request is sent like Black-
	Berry, WAP, J2ME etc. Values (¿6) will be provided
	later.
bankID	Bank Id as entered by the subscriber/merchant. For
	future use. The default value is 153 (Bank Sinarmas)
mode	The API mode. The modes currenlty supported are
	shown in Table 4
transferID	mFino ID of a transaction. To be used by the client
	to maintain the conversational state across API calls.
parentTxnID	mFino ID of an activity. To be used by the client to
	maintain the conversational state across API calls.

Table 1: Web API request parameters



SERVICE NAME	DESCRIPTION		
activation	Activate entity (subscriber, bank account etc) by set-		
	ting pin		
checkBalance	Check balance of the default pocket		
changePin	Change pin by providing old pin and new pin		
resetPin	Reset pin by providing security answer		
getTransactions	Retur the last n transactions. Currently only n=3 is		
	supported		
recharge	Topup the airtime balance of a subscriber		
transfer	Transfer a commodity (airtime, money) between two		
	entities		
changeSettings	Change subscriber's settings like email, language and		
	notification method		

Table 2: Service names to be used in the Web API requests

BUCKET TYPE	DESCRIPTION
Reg	Regular airtime
Cal	Call and SMS
Dat	Data
SPL	Special purpose

Table 3: Bucket types used by the billing system

2 Subscriber API

This section describes all the basic mWallet functions pertaining to subscriber that can be accessed by the API. The **mode** parameter must be set to **1** (subscriber) for all these functions.

2.1 Activation

Activation is the process of a subscriber activating his/her mobile commerce account with the operator. A subscriber has to be activated before performing any mobile commerce activities or transactions. The process of activation includes the pin set up as well. The following mandatory parameters have to be sent for activation:

- 1. serviceName=activation
- 2. sourceMDN



MODE TYPE	VALUE	DESCRIPTION
Subscriber	1	subscriber services
E-Load Merchant	2	airtime merchant services
Bank Account	3	bank account/emoney services

Table 4: Values for different API modes

- 3. sourcePIN
- 4. secretAnswer
- 5. contactNumber
- 6. mode=1 (subscriber)
- 7. channelID

Request:

serviceName=activation&sourceMDN=621234567890&sourcePIN=123456&secretAnswer=121290&contactNumber=629876543210&mode=1&channelID=7

Response:

<response>

<message code="63">Welcome to M-Commerce Service. You can use your
PIN for Smart Dompet and share load service.

</message>

<transactionTime>28/01/2011 12:22/transactionTime>

</response>

2.2 Shareload

Shareload allows subscribers to transfer talk time/pulsa with other subscribers. In other words it allows subscribers to *share* their eload with others. The following mandatory parameters have to be sent for Shareload service:

- 1. serviceName=transfer
- 2. sourceMDN
- 3. sourcePIN



- 4. destMDN
- 5. amount
- 6. mode=1 (subscriber)
- 7. channelID

Request:

serviceName=transfer&sourceMDN=621234567890&sourcePIN=123456&destMDN=629876543210&amount=12000&mode=1&channelID=7

Response:

```
<response>
```

```
<message code="76">Share load 12000 to 629876543210 on 12/12/2010
    successful.Thank you.
    </message>
    <transactionTime>12/12/2010 12:22</transactionTime>
    <refID>1234567</refID>
</response>
```

2.3 Change Pin

Change Pin service allows subscribers to change their mobile commerce pin. This requires the subscribers to know their existing pin. The following mandatory parameters have to be sent for Change Pin:

- 1. serviceName=changePin
- 2. sourceMDN
- 3. oldPIN
- 4. newPIN
- 5. mode=1 (subscriber)
- 6. channelID

Example:



Request:

 $\tt serviceName=changePin\&sourceMDN=621234567890\&oldPIN=123456\&newPIN=120070\&mode=1\&channelID=8$

Response:

```
<response>
  <message code="26">You have successfully changed your MPIN number on
     2010-06-24 13:15:00.
  </message>
  <transactionTime>24/06/2010 13:15</transactionTime>
```

2.4 Reset Pin

</response>

Reset Pin service allows subscribers to reset their mobile commerce pin by providing a secrete answer set during activation. This is useful in circumstances where the subscriber has forgotten his/her pin. The following mandatory parameters have to be sent for Reset Pin:

- 1. serviceName=resetPin
- 2. sourceMDN
- 3. secretAnswer
- 4. newPIN
- 5. mode=1 (subscriber)
- 6. channelID

Example:

Request:

 $\verb|serviceName=resetPin\&sourceMDN=621234567890\&newPIN=123456\&secretAnswer=12000\&mode=1\&channelID=9|$

Response:

```
<response>
  <message code="47">You have successfully reset your MPIN number on
  2010-06-24 13:15:00.
  </message>
  <transactionTime>24/06/2010 13:15</transactionTime>
</response>
```



2.5 Last n Transactions

This service allows the subscribers to check the last n transactions they have performed or were involved in. Currently n=3 is supported. So, a maximum of 3 transactions can be retrieved. The following parameters have to be sent for Last 3 Transactions:

- 1. serviceName=getTransactions
- 2. sourceMDN
- 3. sourcePIN
- 4. mode=1 (subscriber)
- 5. channelID

Example:

Request:

 $\tt serviceName=getTransactions\&sourceMDN=621234567890\&sourcePIN=123456\&mode=1\&channelID=7$

Response:



2.6 Change Settings

This service allows subscribers to change certain settings like language, email, notification method etc. The following parameters have to be sent for Change Settings function:

- 1. serviceName=changeSettings
- 2. sourceMDN
- 3. sourcePIN
- 4. email
- 5. language (0 English, 1 Bahasa)
- 6. notificationMethod (1 SMS, 2 Email, 3 both)
- 7. mode=1 (subscriber)
- 8. channelID

Example: At least one valid value of email, language and notificaion Method should be sent in the request.

Request:

serviceName=changeSettings&sourceMDN=621234567890&sourcePIN=123456&language=0&email=foo@bar.com&mode=1&channelID=7

Response:

<response>

<message code="552">Your settings change has been successful</message>
<transactionTime>28/01/2011 12:22</transactionTime>
</response>

3 E-Load Merchant API

This section describes all the mWallet services pertaining to Airtime merchants that can be accessed by the API. The **mode** parameter must be set to **2** for all these functions.



3.1 Recharge

The process of a mobile agent/airtime merchant topping up a subscribers talk time is called Recharge. The following mandatory parameters have to be sent for mobile agent recharge:

- 1. serviceName=recharge
- 2. sourceMDN
- 3. sourcePIN
- 4. destMDN
- 5. bucketType
- 6. amount
- 7. mode=2 (e-load merchant)
- 8. channelID

Example:

Request:

serviceName=recharge&sourceMDN=621234567890&sourcePIN=123456&destMDN=629876543210&bucketType=Reg&amount=5000&mode=2&channelID=7

Response:

```
<response>
  <message code="77">Thank you for topping up 5000 on 2010-06-24 13:15:00 to
     629876543210. REF: 1051271. Your airtime stock balance now is 6,655,000.
  </message>
  <refID>1051271</refID>
  <lastBalanceAfterTransaction>6655000</lastBalanceAfterTransaction>
  <sourceRefID></sourceRefID>
  <transactionTime>24/06/2010 13:15</transactionTime>
</response>
```

3.2 Airtime Transfer

An airtime merchant can transfer his/her airtime stock to another airtime merchant using this service. The following mandatory parameters have to be sent for mobile agent recharge.



- 1. serviceName=transfer
- 2. sourceMDN
- 3. sourcePIN
- 4. destMDN
- 5. amount
- 6. mode=2 (e-load merchant)
- 7. channelID

Request:

serviceName=transfer&sourceMDN=621234567890&sourcePIN=123456&destMDN=629876543210&amount=25000&mode=2&channelID=7

Response:

```
<response>
```

<message code="77">Thank you for transferring Airtime Stock of 25000 on
2010-06-24 13:15:00 to 629876543210. Your airtime stock balance now is
6,630,000. REF: 1051272.

</message>

 $\verb| < lastBalance After Transaction > 6630000 < / lastBalance After Transaction > \\$

<refID>1051272</refID>

<transactionTime>24/06/2010 13:15/transactionTime>

</response>

3.3 Change Pin

Change Pin service allows merchants to change their merchant pin. The merchants are required to know their existing pin. The following mandatory parameters have to be sent for Change Pin:

- 1. serviceName=changePin
- 2. sourceMDN
- 3. oldPIN
- 4. newPIN



- 5. mode=2 (e-load merchant)
- 6. channelID

Request:

serviceName=changePin&sourceMDN=621234567890&oldPIN=123456&newPIN=123654&mode=2&channelID=8

Response:

```
<response>
```

```
<message code="26">You have successfully changed your MPIN number on
2010-06-24 13:15:00.
</message>
```

<transactionTime>24/06/2010 13:15</transactionTime>

</response>

3.4 Reset Pin

Reset Pin service allows airtime merchants to reset their merchant pin by providing a secrete answer that has been set during mobile commerce activation. This is useful in circumstances where the merchant has forgotten his/her pin. The following mandatory parameters have to be sent for Reset Pin:

- 1. serviceName=resetPin
- 2. sourceMDN
- 3. secretAnswer
- 4. newPIN
- 5. mode=2 (e-load merchant)
- 6. channelID

Example:

Request:

 $\verb|serviceName=resetPin\&sourceMDN=621234567890\&newPIN=123456\&secretAnswer=12000\&mode=2\&channelID=9|$



Response:

<response>

<message code="47">You have successfully reset your MPIN number on $2010-06-24\ 13:15:00$.

</message>

<transactionTime>24/06/2010 13:15/transactionTime>

</response>

3.5 Check Balance

This service allows merchants to check their airtime stock balance. The following mandatory parameters have to be sent for Check Balance:

- 1. serviceName=checkBalance
- 2. sourceMDN
- 3. sourcePIN
- 4. mode=2 (e-load merchant)
- 5. channelID

Example:

Request:

 $\tt serviceName=checkBalance\&sourceMDN=621234567890\&sourcePIN=123456\&mode=2\&channelID=8$

Response:

```
<response>
```

<message code="25">Your airtime balance on 2010-06-22 14:35:15 is 6630000

</message>

<balanceDetail>

<commodityType>Airtime</commodityType>

<balance>6630000</balance>

</balanceDetail>

<transactionTime>22/06/2010 14:35/transactionTime>

</response>



3.6 Last Three Transactions

The following parameters have to be sent for Last 3 Transaction.

- 1. serviceName=getTransactions
- 2. sourceMDN
- 3. sourcePIN
- 4. mode=2 (e-load merchant)
- 5. channelID

Example:

Request:

serviceName=getTransactions&sourceMDN=621234567890&sourcePIN=123456 &mode=3&channelID=7

```
Response:
```

```
<response>
<message code="39">Last 3 transactions</message>
<transactionDetails>
 <transactionDetail>
    <commodityType>Airtime</commodityType>
    <refID>1464974</refID>
    <sourceMDN>621234567890</sourceMDN>
    <destMDN>621234567890</destMDN>
    <transactionTime>19/06/2010 09:00/transactionTime>
<transactionType>MA_Topup</transactionType>
    <amount>50000</amount>
  </transactionDetail>
  <transactionDetail>
    <commodityType>Airtime</commodityType>
    <refID>1203947</refID>
    <sourceMDN>621234567890</sourceMDN>
    <destMDN>621234567890</destMDN>
    <transactionTime>17/06/2010 16:30/transactionTime>
<transactionType>MA_Topup</transactionType>
    <amount>50000</amount>
 </transactionDetail>
  <transactionDetail>
```



4 E-Money/Bank Account API

This section describes all the mwallet services pertaining to a subscriber's bank/emoney account. A subscriber is allowed to link his/her bank account to his mobile number (MDN) and then perform transactions using his/her mobile number instead of using the bank account details. A subscriber is currently allowed to actively use either a bank account or an e-money account but not both. Bank account overrides the subscribers emoney account. The **mode** parameter must be set to **3** for all these services.

4.1 Activation

This service allows a subscriber to activate his/her linked bank account by setting up the pin and providing partial card number details. This step is mandatory for accessing the rest of the bank account services. The following mandatory parameters have to be sent for activating the bank account in mWallet.

- 1. serviceName=activation
- 2. sourceMDN
- 3. sourcePIN
- 4. cardPANSuffix
- 5. mode=3 (bankAccount)
- 6. channelID



7. bankID

Example:

Request:

 $\tt serviceName=activation\&sourceMDN=621234567890\&sourcePIN=123456\&cardPANSuffix=440673\&mode=3\&channelID=7\&bankID=153$

Response:

```
<response>
```

<message code="63">Welcome to M-Commerce Service. You can use your PIN for
 Smart Dompet service. For info call 881.

</message>

<transactionTime>28/01/2011 12:22/transactionTime>

</response>

4.2 Recharge

This service allows a subscriber to topup his/her airtime by paying through the linked bank account¹. The following mandatory parameters have to be sent for recharge (self or others) via bank account:

- 1. serviceName=recharge
- 2. sourceMDN
- 3. sourcePIN
- 4. destMDN
- 5. bucketType
- 6. amount
- 7. mode=3
- 8. channelID
- 9. bankID

Example:

¹Emoney account can be used whereever bank account is mentioned in this section



Request:

serviceName=recharge&sourceMDN=621234567890&sourcePIN=123456&destMDN=629876543210&bucketType=Reg&amount=5000&mode=3&channelID=7&bankID=153

Response:

4.3 Funds Transfer

A subscriber can transfer money from his/her bank account to another subscriber's bank account using this service. Since fund transfer involves a confirmation step, this is split into two steps. The first step is to perform an inquiry and the second is to transfer money.

4.3.1 Transfer Inquiry

The following mandatory parameters have to be sent for transferInquiry.

- 1. serviceName=transferInquiry
- 2. sourceMDN
- 3. sourcePIN
- 4. destMDN
- 5. amount
- 6. mode=3
- 7. channelID
- 8. bankID

Example:



Request:

serviceName=transferInquiry&sourceMDN=621234567890&sourcePIN=123456&destMDN=629876543210&amount=12000&mode=3&channelID=7&bankID=153

Response:

4.3.2 Money Transfer

Money transfer service requests the bank to transfer funds between the source and destination accounts. A transferInquiry has to be performed before a money transfer action. Money Transfer has to be performed within X seconds (as configured in the platform) of performaning a transferInquiry failing which the transfer is expired.

The API client can use this as a user confirmation mechanism. The client can prompt the end user to confirm the data from the transferInquiry before performing a money transfer.

The following mandatory parameters have to be sent for transfer.

- 1. serviceName=transfer
- 2. sourceMDN
- 3. sourcePIN
- 4. destMDN
- 5. amount
- 6. mode=3 (bankAccount)
- 7. channelID
- 8. bankID
- 9. transferID



- 10. parentTxnID
- 11. confirmed

Request:

 $\label{localized} serviceName=transfer\&sourceMDN=621234567890\&sourcePIN=123456\&destMDN=629876543210\&amount=12000\&mode=3\&channelID=7\&bankID=153\&transferID=1000123\&parentTxnID=78911231\&confirmed=true$

Response:

4.4 Check Balance

This service allows a subscriber to check his/her bank account balance. The following mandatory parameters have to be sent for Check Balance.

- 1. serviceName=checkBalance
- 2. sourceMDN
- 3. sourcePIN
- 4. mode=3
- 5. channelID
- 6. bankID

Example:

Request:

serviceName=checkBalance&sourceMDN=621234567890&sourcePIN=123456&mode=3&channelID=8&bankID=153

Response:



```
<response>
  <message code="274">Your balance on 2010-06-22 14:35:15 is IDR 2,000,000
  </message>
  <balanceDetail>
        <commodityType>Money</commodityType>
        <balance>2000000</balance>
        <transactionTime>22/06/2010 14:35</transactionTime>
  </balanceDetail>
  </response>
```

4.5 Change Pin

Change Pin service allows subscribers to change their bank account pin. The subscribers are required to know their existing pin.² The following mandatory parameters have to be sent for Change Pin.

- 1. serviceName=changePin
- 2. sourceMDN
- 3. oldPIN
- 4. newPIN
- 5. mode=3
- 6. channelID
- 7. bankID

Example:

Request:

serviceName=changePin&sourceMDN=621234567890&oldPIN=123456&newPIN=120700&mode=3&channelID=8&bankID=153

Response:

```
<response>
```

```
<message code="26">You have successfully changed your MPIN number on
2010-06-24 13:15:00.
```

</message>

<transactionTime>24/06/2010 13:15/transactionTime>

</response>

 $^{^2}$ Please note that a bank account pin can not be reset using this API. In other words, there is no reset pin.



4.6 Last Three Transactions

The following parameters have to be sent for Last 3 Transaction.

- 1. serviceName=getTransactions
- 2. sourceMDN
- 3. sourcePIN
- 4. mode=3
- 5. channelID
- 6. bankID

Example:

<bankID>153</bankID>

Request:

serviceName=getTransactions&sourceMDN=621234567890&sourcePIN=123456 &mode=3&channelID=7&bankID=153

```
Response:
<response>
<message code="25">Last 3 transactions</message>
<transactionDetails>
  <transactionDetail>
    <commodityType>Money</commodityType>
    <refID>1464874</refID>
    <sourceMDN>621234567890</sourceMDN>
    \dots MDN > 621234567890 < \dots MDN > <!-- only for emoney txns -->
    <transactionTime>19/06/2010 09:00/transactionTime>
    <amount>50000</amount>
    <bankID>153</pankID>
  </transactionDetail>
  <transactionDetail>
    <commodityType>Money</commodityType>
    <refID>1203247</refID>
    <sourceMDN>621234567890</sourceMDN>
    \dots MDN>621234567890</dest MDN> <!-- only for emoney txns -->
    <transactionTime>17/06/2010 16:30</transactionTime>
    <amount>50000</amount>
```



