

Basics of Structured Financial Messaging System (SFMS) Standard for Mobile Payments in India

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Structured Financial Messaging System (SFMS) is a secure messaging standard developed to serve as a platform for intra-bank and inter-bank applications. It is an Indian standard similar to SWIFT (Society for World-wide Interbank Financial Telecommunications) which is the international messaging system used for financial messaging globally. SFMS can be used practically for all purposes of secure communication within the bank and between banks. The SFMS was launched on December 14, 2001 at IDRBT. SFMS has a number of special features and it is a modularized and web enabled software, with a flexible architecture facilitating centralized or distributed deployment. The access control is through Smart Card based user access and messages are secured by means of standard encryption and authentication services conforming to ISO standards. RBI applications like Real Time Gross Settlement (RTGS), Negotiated Dealing System (NDS), Security Settlement System (SSS) and Integrated Accounting System (IAS) have interface with SFMS and RTGS uses SFMS for messaging.

The intra-bank part of SFMS, which is most important, is used by the banks to take full advantage of the secure messaging facility it provides. The inter-bank messaging part is useful for applications like Electronic Funds Transfer (EFT), Real Time Gross Settlement System (RTGS), Delivery Versus Payments (DVP), Centralized Funds Management System (CFMS) etc. The SFMS provides easy to use Application Program Interfaces (APIs), which can be used to integrate all existing and future applications with the SFMS. Several Banks have integrated it with their core or centralized banking software.

In order to explore how SFMS can be used for Mobile Payments in India, let us look at the scope of different Message types, that it provides. They are (a) several messages with specific INFINET (Indian Financial Network) Format Number (IFN) for each of the IFC (INFINET Format Category) message, (b) Proprietary Messages and (c) System Messages. The IFC and IFN follow the pattern of SWIFT standards. The following are the categories of IFC messages.

- IFC 1 - Customer Payments and Cheques
- IFC 2 – Financial Institution Transfers
- IFC 3 – Treasury Markets – Foreign Exchange, Money Market, Derivatives
- IFC 4 – Collections and Cash Letters
- IFC 5 – Securities Markets
- IFC 6 – Precious Metals and Syndications
- IFC 7 - Documentary Credits and Guarantees
- IFC 8 – Travelers Cheques
- IFC 9 – Cash Management and Customer Status
- IFC n – Common Group Messages

Each category or series has several message formats. For example, some of the different types of Inter-Bank and Intra-Bank Messages used in the series are as follow :

1. Customer TTs – IFN 100, 102
2. DD related messages - IFN 110, 111 & 112
3. Transfer of Funds to another Bank (On account of TT discounted with the local Branch of the Beneficiary Bank) - IFN 202, 203
4. Information regarding Funds expected from another Bank (Being funds expected on account of TT discounted by their local Branch) - IFN 210
5. Messages relating to Collection Bills IFN 400, 410, 412, 420, 422 & 430
6. Documentary Credit related messages - IFN 700, 701, 705, 707, 710, 711, 720, 721, 730, 740, 742, 747, 750, 752, 754 & 756
7. Messages relating to Bank Guarantees - IFN 760, 769
8. Debit/Credit Advices - IFN 900 & 910
9. Currency Chest related transactions - IFN 298 C Series (proprietary)
10. Govt. Account Transactions - IFN 298 G Series
11. G-Sec Transactions - IFN 598 S Series
12. RTGS – R Series, IAS – I Series

13. Returns & Statements - All kinds of Returns & Statements can be sent in machine readable format using proprietary IFN messages n98
14. Letters – All types of letters like sanction, endorsements, Proposals, Transfer Orders, Circulars can be relayed in strict confidence duly authenticated by the legally enforceable Digital Signature of the sender in n99 Free Format

A typical SFMS user-to-user message structure consists of the following five blocks:

- {1: BASIC HEADER BLOCK}
- {2: APPLICATION HEADER BLOCK}
- {3: USER HEADER BLOCK}
- {4: TEXT BLOCK}
- {5: TRAILERS BLOCK}

Blocks 1,2 and 3 are related to header information. Block 4 contains the text of the message, and block 5 contains the trailer information. Blocks 3,4 and 5 may contain sub-blocks (i.e. blocks within blocks) or fields delimited by field tags, depending on the nature of the message.

IFSC (Indian Financial System Code) :

The system has 11-digits coding to identify the banks / financial institutions and their branches as given below.

Character position	Information	Remarks
First four characters	Bank code	Same code as in SWIFT (ISO 9362)
Fifth Character	Zero	Reserved for future use
Last six characters	Branch code	Banks can use their existing codes with no white spaces (zeroes prefixed)

For international payments transformation of SFMS messages into SWIFT format and vice versa is done by Banks individually or through a consortium or a centralized agency.

SWIFT has the following salient features: (A) Bank Identifier Codes (BIC), (B) Message Structure, (C) Message Categories, (D) Message Types, (E) Message Fields

(A)Bank Identifier Codes (BIC): The BIC consists of 11 alphanumeric characters. The first four alphabetic characters represent the name of the bank, next two alphabetic characters stand for the country, the next two alphanumeric characters for the location of the SWIFT gateway followed by the branch code. For example, SBIN IN BB 107 (SBIN – Bank Code, IN= Countrycode, BB=location code, 107=Branch code)

(B) Message Structure : SWIFT Messages conform to defined block structures. Each block of message contains data of a particular type and used for a particular purpose. A typical SWIFT Message consists of: (a) Basic Header Block, (b) Application Header Block, (c) User Header Block, (d) Text Block and (e)Trailer Block

(C) Message Categories: The various financial and non-financial transactions which take place in any organisation are brought under 11 categories. Looking to the type of transaction, every category has been given unique number starting from 0 to 9 and n. The category usually describes at a general level, the underlying business function of the message. The following are the categories of messages:

- 0 System Message
- 1 Customer Transfer
- 2 Bank Transfer
- 3 Loans, Deposits & Foreign Exchange
- 4 Collections
- 5 Securities
- 6 Precious Metals & Syndications
- 7 Documentary Credits and Guarantees

- 8 Travellers' Cheques
- 9 Customer Status
- n Free Format Message

(D) Message Types: In each category of messages listed above, looking to the particular type of transaction the message categories have been further divided into different Message Types (MT). A relevant message type should be used for a particular type of transaction to enable the system to validate and process without loss of time. However, where a particular message cannot be classified under any type, Free Format Messages can be used.

MT n	X	X
(Category)	(Group)	(Type)

(E) Message Fields: Every message type has fields identified by a given field number of which some are mandatory and others are optional in nature. Every field number in that particular type of message has a unique meaning and remains same through out.

It is recommended that SFMS Standard is used for Mobile Payments in India, since it adds value in terms of security, interoperability, uniformity and automated routing for real time settlement. In our opinion some of the Message Formats that can be used for Mobile Payments are IFN 100 and IFN 102. IFN 100 message type is sent by or on behalf of the financial institution of the Ordering Customer, directly or through a correspondent(s), to the financial institution of the Beneficiary Customer. It is used to convey a funds transfer instruction in which the Ordering Customer or the Beneficiary Customer, or both, are non-financial institutions from the perspective of the Sender. The IFN 102 is useful to convey mass payment instructions between financial institutions for clean payments. Its use is subject to bilateral/multilateral agreements between sender and receiver. These bilateral agreements cover amongst others, the transaction amount limits and their settlement. Institutions are recommended to use the Mass Payments. The IFN 102 is sent by or on behalf of the financial institution of the Ordering Customer(s) to a financial institution of the Beneficiary Customer(s). It requests the Receiver to credit the Beneficiary Customer(s) directly or through a domestic clearing mechanism via another financial institution in the receiving country, or to issue a cheque to the Beneficiary. A customer can pay various utility payments as telephone, electricity, cable bills etc. through his/her mobile phone.

SFMS standard and software developed by RBI and IDRBT through the implementation software company TCS, India has a three level architecture, consisting of a HUB at IDRBT, a Gateway at each bank and Online Servers, Offline Servers and Terminals at branches.

Hub System: The hub System is a Compaq Himalaya Server located at IDRBT, Hyderabad. It switches Inter-Bank messages from the sending Bank's Gateway to the receiving Bank's Gateway.

Bank Gateway: Each Bank or a correspondent Bank has a gateway system. The Gateway system switches all the Intra-Bank messages received from the Sending Branch Server to the Receiving Branch Server and forwards all Inter-Bank messages addressed to other Banks to the Hub system. It also receives Inter-Bank messages addressed to its own Branches and switches them to the appropriate Branch Server.

Online terminals: Online terminals are PCs, which use a standard browser to connect to the Branch Server and they do not require any SFMS software module. These terminals allow creation, viewing of messages etc. at the Branch Server, and copies of such messages will not be stored in these terminals. Users in online Branches connect to the Branch Server to create, verify and authorize outgoing messages and to list, view and process incoming messages.

Offline Servers: Offline Servers are PCs that are provided with the SFMS Offline software module, which allows Offline creation, verification, authorization, viewing and processing of messages. Offline Servers connect to a Branch Server to send/receive messages. Unlike online terminals, copies of sent and received messages are stored at the Offline Server.

This approach paper in our opinion will be useful to look into the SFMS standard for enabling mobile payments in India and devise new message formats along with the existing ones of SFMS for varied applications. This will not only bring uniformity of convenience to the user for multiple services across multiple types of phones and their service providers but will also ensure last mile security till the host device and the user with the embedded option of Public Key Infrastructure set up.

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