

**South African Reserve Bank**

**National Payment System Department**

**Position Paper on the  
Interbank Settlement Application Interfaces**

(Note: This Position Paper supersedes Position Papers NPS 01/2008 and 02/2008 effective from 2014-04-22)

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## **1. Executive summary**

This document outlines the interfaces made available by the South African Reserve Bank (Reserve Bank) for Reserve Bank settlement system participants (“participants”) to connect with and take part in the Real-Time Gross Settlement (RTGS) system provided by the Reserve Bank. It is necessary to issue updates from time to time as may be required to reflect changes in the business practices, procedures or the underlying technical infrastructure architecture.

Position Papers NPS 01/2008 and 02/2008 are hereby withdrawn and replaced by this Position Paper NPS 01/2014. This is to ensure that participants in the settlement system are in no doubt about which technical arrangements are in place as well as administrative guidelines regarding the application and interpretation of the provisions of the National Payment System Act, 1998 (Act No. 78 of 1998) (the” NPS Act”), are in force at a particular time.

## **2. Introduction**

In line with international best practise and the NPS Act, the Reserve Bank provides an RTGS system to facilitate final and irrevocable settlement in central bank money. For this purpose, the following information technology infrastructure components have been established by the Reserve Bank:

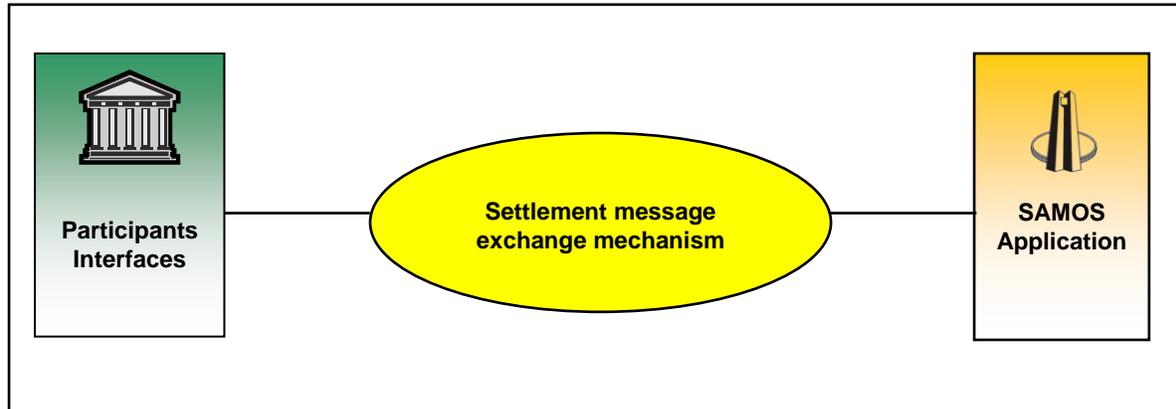
- The RTGS system, known as the South African Multiple Option Settlement (SAMOS) system; and
- The interfaces through which settlement instructions and related messages can be exchanged between the Reserve Bank and participants.

This position paper describes the architectural design of the components of the RTGS system and its interfaces.

### 3. Components of the RTGS system

The RTGS system consists of the following components:

**Figure 1 Components of the RTGS system**



#### 3.1. SAMOS application

The SAMOS application processes instructions to conclude the settlement of obligations between banks across their accounts at the Reserve Bank.

#### 3.2. Participant interfaces

A set of user interfaces at every participant which provides for the following functionality:

- An Instruction Generation facility through which participants generate settlement instructions for submission to the SAMOS system;
- a Notification Receipt facility through which participants receive unsolicited notifications from the SAMOS system;
- an Enquiry facility through which banks enquire about various aspects and status of instructions and the SAMOS system in general; and
- a facility through which banks monitor their current positions in their accounts at the Reserve Bank.

#### 3.3. Settlement message exchange mechanism

An interbank message exchange mechanism which enables banks, as well as a number of other institutions (acting on behalf of the banks) involved in the exchange of interbank payments and settlement instructions, to link to the SAMOS system.

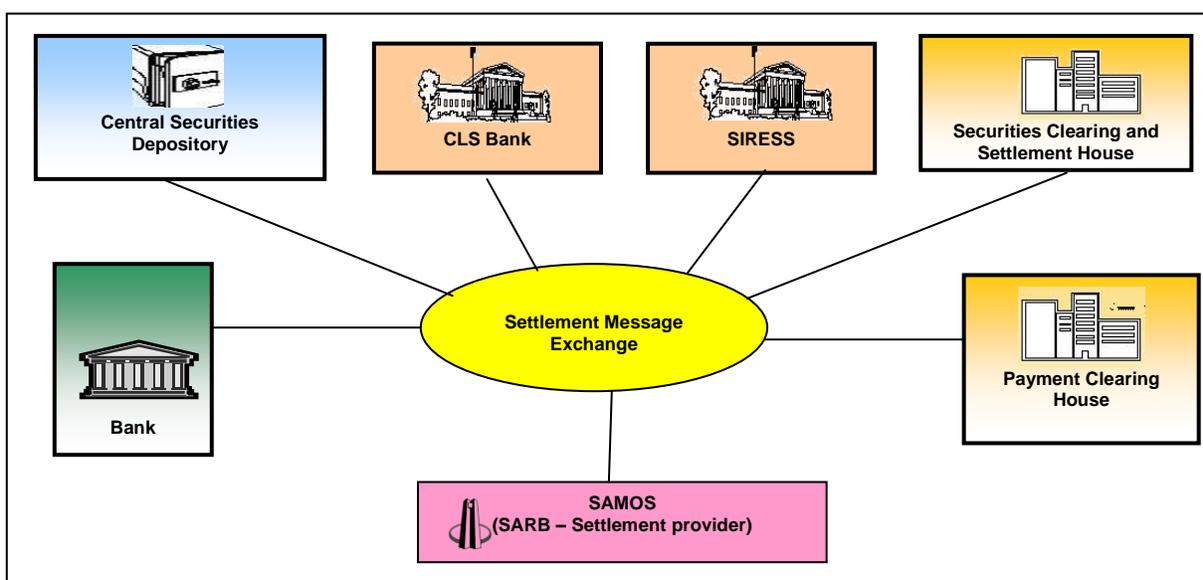
Associated with this message exchange mechanism is the physical connectivity from every participant to a message exchange service, as well as the message-oriented middleware which enables messages to be electronically exchanged.

Message carriers are defined as facilities through which the various messages can be submitted and routed to the SAMOS application and the appropriate participant destinations in a secure environment.

## 4. Participants

Every settlement instruction involves at least two participants, in addition to the Reserve Bank as settlement provider. The following types of participants are involved:

**Figure 2 Participants**



### 4.1. Domestic banks

#### 4.1.1. The Paying Bank

The Paying Bank is the initiator of payment transactions. The Paying Bank submits an instruction to the SAMOS application directly or through its agents (i.e. Payment Clearing House System Operator, the Securities Clearing and Settlement House or Central Security Depositories) for processing in terms of the business specification of SAMOS.

#### **4.1.2. The Beneficiary Bank**

The Beneficiary Bank receives unsolicited messages notifying it that it is the recipient of funds from a Paying Bank.

#### **4.2. The Payment Clearing House System Operator**

The Payment Clearing House System Operator (PCH SO) forwards settlement instructions, on behalf of its participants, to the Reserve Bank.

#### **4.3. Central Securities Depositories**

Central Securities Depositories (CSD) forward lists of securities that banks reserve for collateralisation purposes in the SAMOS system, to the Reserve Bank, on instruction from a particular bank.

Currently immobilised securities are kept in the Central Securities Depository (CSD).

#### **4.4. Securities Clearing and Settlement House**

The Securities Clearing and Settlement House forward fund settlement positions to the Reserve Bank, on behalf of the banks responsible for settlement of payments. In this context, the SAMOS system facilitates the settlement of securities upon settlement of funds.

#### **4.5. CLS Bank International**

CLS Bank International is a participant in the SAMOS system. South African banks are able to fund Rand obligations resulting from foreign trades into the settlement account of the foreign exchange settlement bank (CLS Bank) in the SAMOS system. The CLS Bank International is also able to pay out Rand amounts to South African banks participating in the SAMOS system. This process facilitates simultaneous settlement of the domestic payment and the foreign currency leg of the transaction, thereby giving effect to payment-versus-payment practices.

## 4.6. SIRESS

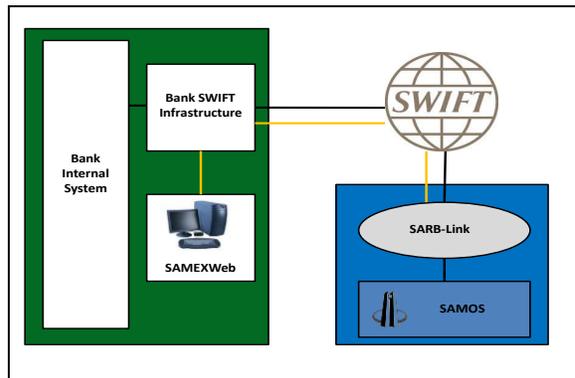
SADC Integrated Regional Electronic Settlement System (SIRESS) has been designated as a designated settlement system in the SAMOS system. SIRESS has been developed as part of the regional integration project in SADC and the Reserve Bank has been appointed by the Committee Central Bank Governors in SADC (CCBG) as the SIRESS operator. Banks (including Central Banks) and non-banks in SADC who meet the conditions for access to SIRESS can use SIRESS for cross-border credit transfers requiring immediate settlement within SADC, achieving real-time gross settlement in Rand central bank money (in the books of the Reserve Bank).

## 5. Architecture of the Settlement Message Exchange mechanism

### 5.1. Components

The message exchange architecture consists of a number of components:

**Figure 3 Settlement message exchange mechanism**



#### 5.1.1. Interbank settlement message exchange service (SARB-Link)

The core of the message exchange infrastructure is a message management and routing facility known as SARB-Link.

SARB-Link accepts instructions through the SWIFTNet services and routes these instructions to the SAMOS application. On completing its processing, the SAMOS application passes messages back to SARB-Link, which routes the messages through the appropriate SWIFTNet services.

SARB-Link isolates the SAMOS application from communication intricacies and ensures that the transmission and routing of settlement instructions are secure, auditable and reliable. Functions performed by SARB-Link include:

- validation of instruction header information, including the logical and physical network addresses and message types;
- message authentication and encryption/decryption, as well as user and security key administration;
- secure routing of instructions based on routing rules and message types;
- logging and time stamping of messages, and maintenance of an audit trail of every message as well as enquiry facilities on the status of messages;
- intermediate safe storing of messages for delivery to the destination;
- the sequencing and queuing of messages from various sources;
- guaranteed once and once only delivery of messages; and
- communication protocol conversion and communication gateway services for the predetermined protocols and communication software interfaces.

### **5.1.2. Connectivity to SARB-Link**

Participants are able to connect to SARB-Link by using the SWIFTNet service as a message carrier.

Participants provide for their own access to the SWIFTNet services, including the communication lines, hardware and software required to interface with the SWIFTNet network and services as prescribed by SWIFT.

The Reserve Bank's SARB-Link infrastructure includes connectivity to the SWIFTNet services.

### **5.1.3. Security**

The security of the SAMOS system is based on the standard security features provided by SWIFT as part of the SWIFTNet services. The allocation of access rights and privileges are controlled by the Reserve Bank based on the Trust Model documented in the Security Practice Statement (SPS), which is available to participants.

The security system provides for the:

- authentication of participants;
- encryption/ decryptions of messages;
- digital signing of messages to ensure authenticity; and
- non-repudiation of messages.

Each participant is responsible for security within its own environment, including the preparation of instructions before their submission to the SWIFT message carrier service.

#### **5.1.4. Participants' interfaces**

Participants require a set of application interfaces through which the SAMOS application can be accessed, that provides for the following functionality:

- Instruction Generation - this function enables the participants to create and send settlement instructions to the SAMOS application;
- Confirmation and Notification - this function processes the messages received from the SAMOS application, be they either solicited or unsolicited messages;
- Enquiries - this function is required to enable the banks to perform the range of enquiries available in the SAMOS application ranging from account details to settlement instruction status/history; and
- Monitoring - this function enables the banks to monitor their positions in the SAMOS system on a continuous basis, with automated position refresh messages sent to the bank as its account position changes

The SAMOS application can be accessed via SARB-Link using one or more different user interface approaches. These approaches are as follows:

- A SWIFT system interface developed by participants to integrate their internal applications with the SAMOS system through predetermined message layouts based on the communications interface supported by the SWIFTNet FIN and FIN Copy services. This user interface provides for Instruction Generation, Confirmation and Notification, and a subset of the Enquiry functions and the Monitoring function.
- An Information Exchange Interface known as SAMEXWeb, which provides for Intra

Account Transfers, Administration, Management, Enquiry and Monitoring functionality only. SAMEXWeb is a browser-based graphical user interface, based on the SWIFTNet Browse Evolution service.

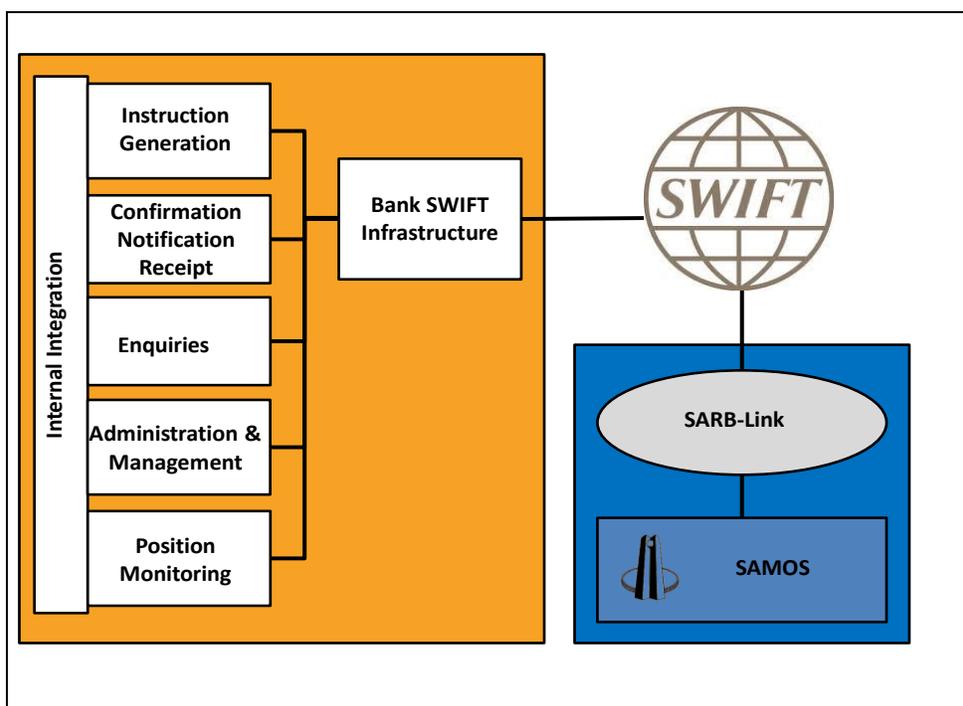
Banks will use both user interfaces in order to meet their operational business requirements. Other non-bank participants will only use the SWIFT System Interface.

#### 5.1.4.1. SWIFT system interface

The SWIFT system interface provides access to a subset of the SAMOS functions from participants' applications via the SWIFTNet FIN and FIN Copy services. The standard communications infrastructure and security specifications stipulated by SWIFT are used to access the SAMOS application.

The SWIFT system interface does not provide access to the full complement of SAMOS functions. It supports Instruction Generation, Confirmation and Notification, Statement Enquiries and Position Monitoring. The balance of the Enquiry functions is currently not available through this interface.

**Figure 4 SWIFT system interface**



## **Responsibilities**

The Reserve Bank is responsible for the following:

- establishment of the connection from the Reserve Bank to SWIFT network partners;
- establishment and maintenance of the SWIFT interface in SARB-Link, including compliance with the SWIFT standards as revised from time to time;
- processing of the instructions received via SWIFT in accordance with the agreed service levels; and
- development and provision of the SAMOS interface specifications.

The participant is responsible for the following:

- establishment and maintenance of connections from its own institution to the SWIFT network partners; and
- ensuring that the level of security implemented on the SWIFT connection complies with the agreed minimum standard.

SWIFT is responsible for the

- delivery of instructions to and from SARB-Link in accordance with the service levels agreed upon between the Reserve Bank and SWIFT.

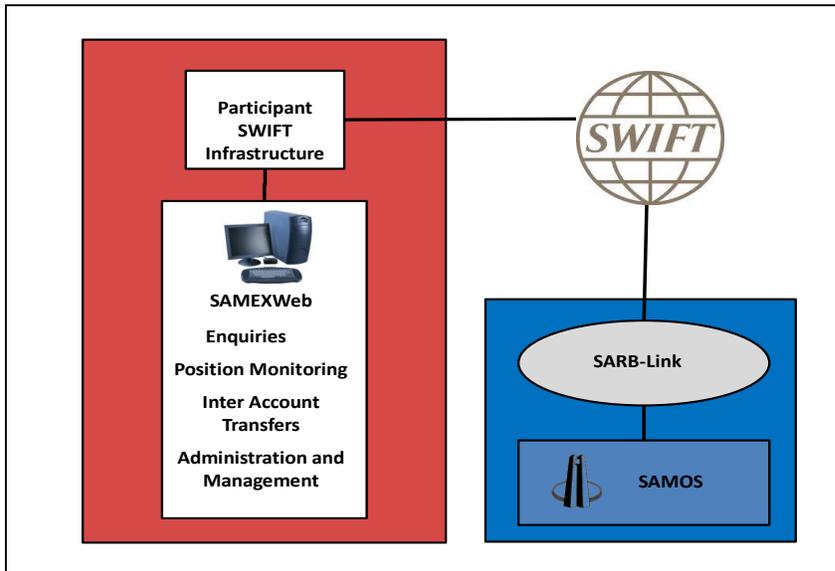
SARB-Link service levels are dependent on the level of service provided by SWIFT.

### **5.1.4.2. Information exchange interface (SAMEXWeb)**

The Reserve Bank has developed an Information Exchange Interface known as SAMEXWeb, which provides participants with access to the Position Monitoring, Inter Account Transfer, Administration, Management, Enquiry and general monitoring functions of SAMOS.

SAMEXWeb is a browser-based graphical user interface, based on the SWIFTNet Browse Evolution service. Any participant may deploy any number of SAMEXWeb instances on workstations connected to the participant's intranet, on condition that the workstations comply with the minimum prescribed requirements and the participant users have been issued with SAMEXWeb user authentication credentials as prescribed in the SPS.

**Figure 5 Information exchange interface**



## **Responsibilities**

The Reserve Bank is responsible for the development and provision of SAMEXWeb.

The participant is responsible for the

- establishment and management of connection from its own institution to SARB-Link via the SWIFTNet Browse Evolution services;
- issuing each SAMEXWeb user with the prescribed SWIFTNet Browse Evolution user credentials and ensuring that the user is registered at the Reserve Bank on the SAMEXWeb server as detailed in the SPS; and
- provisioning of technical infrastructure according to prescribed standards.

## **6. Service Level Agreements**

SARB-Link forms an integral part of the service of the SAMOS system, and is subject to the SAMOS Service Agreement. In addition, the continuity of SARB-Link is designed to provide for the service levels demanded by and agreed upon for the SAMOS system.

## **7. Benefits of the Message Exchange Architecture Adopted**

The SARB-Link architecture design approach provides the following important benefits:

## **7.1. SWIFT service**

The selection of SWIFTNet as the message carrier service capitalises on the benefits already provided by SWIFT to its user base. These benefits include:

- containment of cost through the re-use of existing infrastructure;
- protecting the participant's investment in SWIFT and associated applications, and minimising the impact on system development;
- providing for the cross-border and domestic payment legs of settlement instructions on the same message carrier service; and
- through the proven reliability of SWIFT, meeting the availability and security levels demanded by the National Payment System.

## **7.2. SAMEXWeb application**

The SAMEXWeb application complements the standard SWIFT system interface by:

- providing affordable browser-based access to the enquiry and monitoring functions of the SAMOS system; and
- enabling event-driven position refresh and monitor facilities for participants.

## **8. Conclusion**

The SARB-Link architecture has supported the provision of a RTGS system and has continued to evolve since the SAMOS system first went live in 1998. It has ensured that the participants' interests are optimally served, not only for the initial implementation of the SAMOS system, but also for future developments related to the system. It will continue to evolve over time as technology and business requirements evolve, thereby ensuring:

- an appropriate, affordable and cost-effective means for participants to interface with the SAMOS system;
- a solution based on the *de facto* standards for processing financial transactions.
- a modular approach which is easily adapted or expanded to satisfy future business needs.
- the isolation and protection of the applications resident at the various participants from one another and the Reserve Bank through the use of a message-based instruction flow.