SWIFT Messaging Services

Distributed Architecture Phase 1

White Paper

Version 1.5

This document provides customers with an overview of the technical aspects of the first phase of the distributed architecture and describes its impact on them

December 2009

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Translations

The English version of SWIFT documentation is the only official and binding version.

Trademarks

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1 Executive summary

In 2007, SWIFT's Board of Directors approved a proposal for a multi-zonal messaging architecture – a crucial step in strengthening secure global financial messaging over SWIFT. This new distributed architecture allows SWIFT to meet customer requirements for increased processing capacity, improved resilience, continued cost efficiency, and data protection.

The first phase of the Distributed Architecture programme, which SWIFT plans to complete by the end of 2009,

- enhances the core platform that will run messaging services in a Trans-Atlantic Zone and a European Zone
- improves resilience by reducing disaster recovery times, decreasing customer impact and lessening the risk of service outages
- includes a new operating centre in Europe. This second European operating centre will ensure that intra-European FIN messaging remains in Europe, addressing data protection concerns. The Netherlands operating centre will be the global operating centre during this phase, supporting both the Trans-Atlantic and European Zones
- establishes a new Central Command Centre in Asia Pacific

Applications outsourced to SWIFT will be located in the operating centre selected by and agreed between SWIFT and a third party.

In Distributed Architecture Phase 2, which SWIFT currently plans to complete by the end of 2012, a newly built operating centre in Europe will be running as the global operating centre for the Trans-Atlantic Zone and the European Zone.

Implementation of Distributed Architecture Phase 1 introduces new features that require customer action to be compliant. This document provides a brief overview of Distributed Architecture Phase 1, how it differs from the current architecture, and the actions that customers have to take.

Some of the key changes are in the areas of SWIFTNet Link, hubbing (shared interfaces), synonym destinations, FINCopy services, and FINInform services.

- Customers have to install a new SWIFTNet Link and / or WebStation patch or a minor SWIFTNet release. The Distributed Architecture Phase 1-enabled SWIFTNet Link and WebStation ensure that traffic is directed to the appropriate zone.
- FIN traffic generated for synonym destinations is stored and processed in the zone of its master destination. To address data protection concerns of the European Zone, Trans-Atlantic masters cannot operate synonyms in the European Zone.
- FINCopy and FINInform messages are processed and stored in both the originating as well as the receiving zone.

2 Introduction

2.1 Purpose of this paper

This paper describes the technical aspects of the Distributed Architecture Phase 1, how it affects customers and the actions that customers need to take in order to be compliant.

2.2 Who should read this paper?

All SWIFT customers that require information about the distributed architecture should read this paper. Both an operational and a legal / regulatory oriented customer audience may find this information helpful.

Customers can find the latest version of this document at www.swift.com.

2.3 Background

The strong growth of SWIFT's messaging services has put pressure on computer room capacity in the two existing operating centres, OPC US and OPC NL. A project was defined in the 2007 operating plan to start expansion of the existing operating centres to resolve computer room capacity issues expected in the 2010-2011 timeframe.

However, rather than embark on this tactical expansion project, the SWIFT Board and Executive decided instead to investigate a fundamental re-architecture, driven from a broader strategic perspective. To this end, the SWIFT Executive held extensive consultations during the course of 2007 with the Technology and Production Committee and the Re-architecture Board Task Force.

A key component of the distributed architecture is that the storage and processing of FIN messages exchanged between DA-compliant customers in the same zone will be confined only to that zone's operating centres.

SWIFT established several principles to guide the design and implementation of the distributed architecture:

- the transition to the new architecture should be as transparent as possible to customers
- risks associated with the implementation of the distributed architecture must be carefully managed
- the new architecture should be implemented in the minimum possible time
- the distributed architecture must preserve all functionality available with SWIFT's current messaging services
- intra-zone FIN messages must be stored and processed inside the zone
- inter-zone FIN messages must be stored and processed in both zones
- all users must be aware in advance and in a transparent way of where their traffic will be stored and processed (published on www.swift.com)

2.4 Related information

Customers may also find the following documents useful:

Distributed Architecture Frequently Asked Questions > *Knowledge Base tip number 2142124*

Distributed Architecture Country to Zone Allocation List > *Knowledge Base tip number 2157180*

Distributed Architecture Release Planning > *Knowledge Base tip number 2160676*

FIN Service Description

FIN Operations Guide

FINCopy Service Description

FINInform Service Description

2.5 Questions and comments

Please address any questions or comments on the contents of this document to Susan Rogers, Messaging Product Management at susan.rogers@swift.com

3 Overview of the Distributed Architecture

3.1 The new architecture

SWIFT's distributed architecture partitions messaging into zones, with pairs of operating centres cooperating to process and store traffic for each zone, as shown below in figure 1. To address the data protection concerns for zones like the European Zone, this architecture enables storing of the intra-zone data in the same zone.

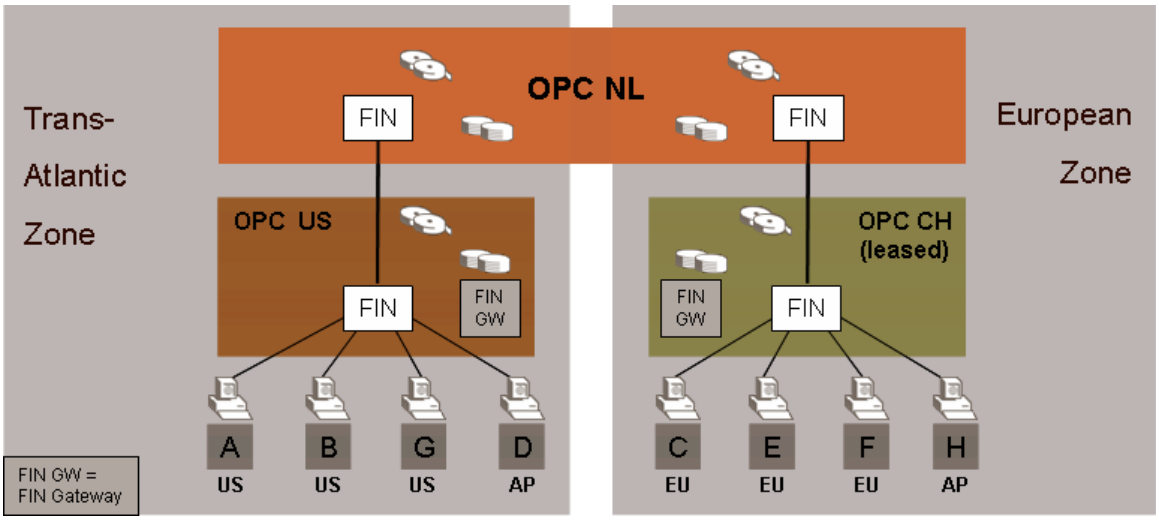

Figure 1: Distributed architecture

The distributed architecture is being implemented in two phases: Phase 1 calls for the minimum implementation possible that addresses European data protection concerns and delivers the highest priority resilience improvements. To implement phase 1 in the shortest possible period, SWIFT accelerated delivery by leasing data centre space from a hosting company. The new European operating centre OPC CH, will serve as the companion for the existing Netherlands operating centre to process and store traffic for the European Zone.

The existing Netherlands operating centre serves as the companion to the US operating centre to process and store traffic for the Trans-Atlantic Zone. In other words, the Netherlands operating centre is the global operating centre.

Phase 2 plans to further enhance the security and reliability of SWIFT's messaging services through specific system and operating centre enhancements.

3.2 Messaging zones

As illustrated in figure 1, distributed architecture allocates traffic to zones. For technical and data protection reasons, SWIFT allocates traffic to zones on a country-by-country basis. In other words, each country is hosted in either the European Zone or the Trans-Atlantic Zone. Upgraded customer interfaces connect to zones at the BIC8 level, with the country code in the BIC8 being used to determine the zone to which to connect. FIN messages exchanged between compliant BIC8s connected to the same zone are processed and stored only in that zone; FIN messages exchanged between compliant BIC8s connected to different zones are processed and stored in both zones as

shown below in figure 2. SWIFTNet store-and-forward storage and processing, for both messages and files, continues to be performed in the EU zone.

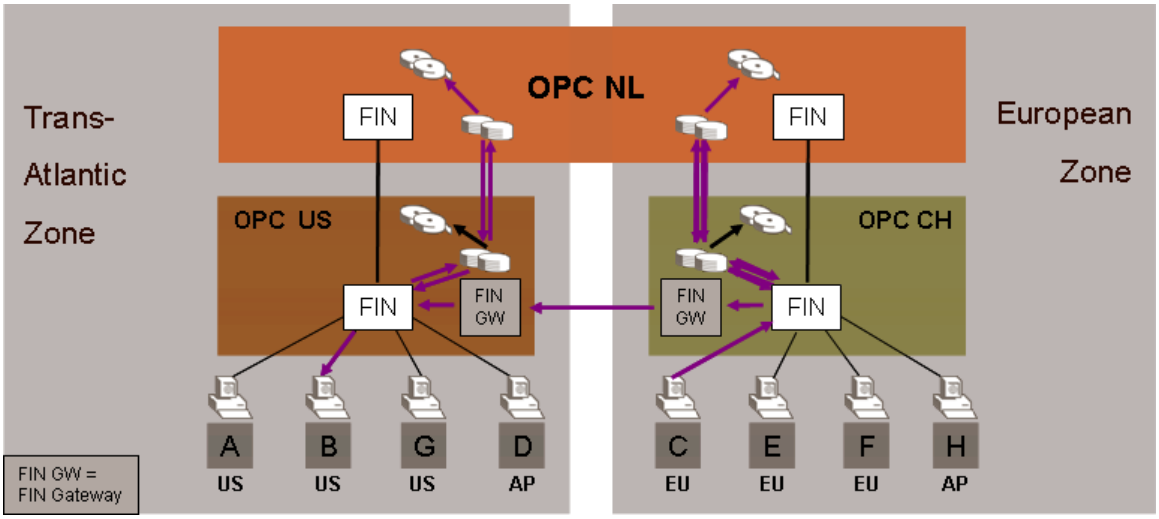

Figure 2: Inter-zone message processing and storage

3.3 Country to zone allocation

Distributed architecture requires the allocation of countries to zones. For reasons of data protection, the countries in the European Economic Area (EEA), Switzerland and other territories and dependencies considered a part of the European Union or associated with European countries have been assigned to the European Zone. To balance traffic and connections across zones, the default allocation of remaining countries is to the Trans-Atlantic Zone, except in cases where a country has requested to be included in the European messaging zone. This preference, expressed by the National Member Group Chairperson, reflects the majority opinion within the country.

The current country to zone allocation is available for consultation on www.swift.com.

3.4 Availability reporting

SWIFT reports on availability for SWIFTNet and FIN core messaging systems. These statistics, currently provided as weighted percentages, have historically reported on global availability. Starting in February 2010 SWIFT will also publish availability information per zone. Availability statistics are published on the Operational Status page on swift.com.

4 Expected Customer Impact

4.1 Required Customer Action

4.1.1 Background

What is the impact on customers?

The majority of changes related to the Distributed Architecture were internal to SWIFT.

These fall into three main groups:

- Implementation of the physical aspects of the new architecture;
- Internal provisioning activities;
- Activation of the messaging changes.

To ensure that traffic is stored and processed in the correct messaging zone, SWIFT users must install a new SWIFTNet Link and WebStation patch.

4.1.2 Description

There are two active SWIFTNet instances, one in each zone. The Distributed Architecture compliant SWIFTNet Link has the ability to communicate with connections with both zones to ensure correct routing of traffic in all circumstances. Customers that use scripts or other mechanisms to monitor the status of their Tuxedo connections see additional connections (8 instead of 4) once they have implemented the SNL upgrade.

4.1.3 Expected Impact

Distributed architecture also delivers several key resilience and security improvements.

Most customers will just need to deploy an SNL patch. A patch will also be required for those WebStation that connect directly to SWIFT, ie, that do not connect via a SWIFTAlliance Gateway (SAG). Optionally, customers can install release 6.3 if they want to use the additional capabilities offered by this release such as increased Hardware Security Module (HSM) capacity and enhanced SWIFTNet messages features. More information about the contents of release 6.3 is included in the release overview document on swift.com.

Customers must install either the relevant patch or release 6.3 by end November 2009 to be compliant with the Distributed Architecture Phase 1. No functional or operational changes are required on the customers' side.

The overall Distributed Architecture rollout time line is illustrated in Figure 3:

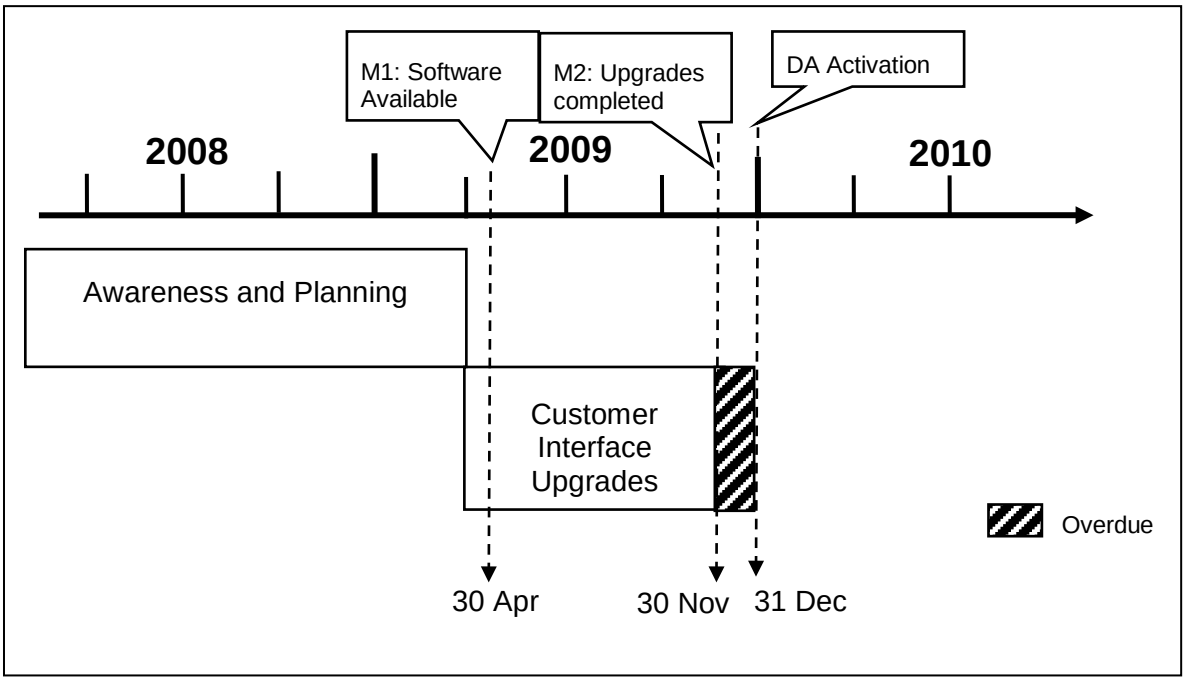

Figure 3: Overall Rollout Timeline

4.2 Hubbing: shared interfaces

4.2.1 Background

Hubbing, or shared interfaces, occurs when more than one BIC8 connects to SWIFTNet through the same interface. Customers typically implement hubbing for operational reasons, for example when a user wants to centralise its operations, or when connecting indirectly through a service bureau.

4.2.2 Description

Hubbing is a pure connectivity option. As described in section 4.1.2, the new version of SWIFTNet Link ensures correct connectivity to the new messaging zones.

Example: A user is operating two destinations BNKA**US**XX AND BANKA**BE**XX from the same interface. DA compliant traffic generated by BNKA**US**XX is directed to the Trans-Atlantic Zone, while traffic generated by BANKA**BE**XX is directed to the European Zone.

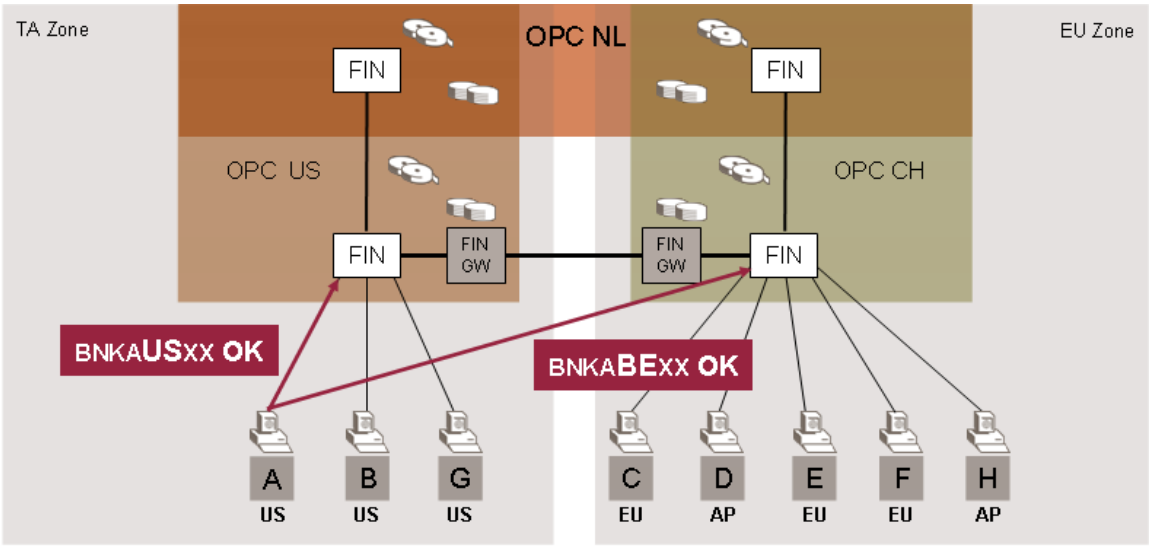

Figure 4: Hubbing – Customer Interface operating several BIC8s belonging to different zones

4.2.3 Expected Impact

The only activity required on the customers' side is to install a new SWIFTNet Link and / or WebStation release.

4.3 Synonym destinations

4.3.1 Background

Synonyms are a purely operational concept used only in FIN messaging. The synonym functionality allows synonym destinations to share their master destination's FIN sessions, thus reducing operational management. From all other points of view, synonym users are the same as all other users.

4.3.2 Description

As synonym destinations do not have their own FIN sessions, their FIN traffic is stored with that of their master destination. With the Distributed Architecture, this means that synonym traffic will be stored and processed in the zone of their master destination.

4.3.3 Expected Impact

As for all other users, master destinations must use the new SWIFTNet Link release.

What will happen in the case of inter-zone master synonym relationships?

Master destinations in the European Zone may operate synonyms in the Trans-Atlantic zone. The FIN traffic of compliant master destinations and all their synonyms is processed and stored in the European Zone.

To address data protection concerns of the European Zone, Trans-Atlantic masters may not operate synonyms in the European Zone.

4.4 FINCopy services

4.4.1 Background

FINCopy is a message duplication service based on FIN. SWIFT developed FINCopy to assist financial communities in implementing centralised systems, for example, Real-Time Gross Settlement (RTGS) or netting systems. Copy services are a mixture of the original user-to-user message, and the copy (full or partial) of that message that SWIFT delivers to a third party in line with service parameters defined by the Service Administrator.

4.4.2 Description

The user-to-user message is processed and stored as described previously.

The copy message (MT 096) is processed and stored in both the zone of the sender of the original message and the zone of the receiver of the copy. **This may result in out of zone data storage and processing.**

4.4.3 Expected Impact

When SWIFT originally introduced the FINCopy service, there was a technical requirement for all FINCopy services working in Y-copy mode to operate two destinations to receive copies, one for each active FIN slice processor system. These destinations are server destinations. Since then, SWIFT has enhanced the FINCopy functionality such that, for all but the bigger volume services, a single server destination is sufficient. Services implemented prior to this change still work with two server destinations.

Given the traffic split between the two messaging zones, the Trans-Atlantic zone requires only one active slice processor. This means that FINCopy services in the Trans-Atlantic Zone use a single primary server destination.

Copy services operating in the European Zone have the option to function with a single or dual server set up as the European Zone requires two active slice processors to handle European Zone FIN traffic.

In line with the predictability and transparency principle, SWIFT invites customers to consult the FINCopy service parameters published on www.swift.com in *Knowledge Base tip number 2135189*.

4.5 FINInform services

4.5.1 Background

FINInform is a copy service based on FIN. It copies all or part of messages to one or more copy destinations in line with the service parameters established by the Service Administrator.

4.5.2 Description

As for FINCopy, the user-to-user message is processed and stored as described previously.

The copy message (MT 096) will be processed and stored in both the zone of the sender of the original message and the zone of the receiver of the copy. **This may result in out of zone data storage and processing.**

4.5.3 Expected Impact

FINInform requires a single server destination. Other than the requirement to install the appropriate SWIFTNet Link release, no impact is expected for destinations receiving copies through the FINInform service.

In line with the predictability and transparency principle, customers can consult the FINInform service parameters on www.swift.com in *Knowledge Base tip number 2138164*.

5 Resilience

5.1.1 Background

The Distributed Architecture improves resilience compared to today thanks to the third operating centre, the new central command centre in the Asia Pacific region, and the implementation of the two messaging zones.

5.1.2 Description

As described in section 3.1 and illustrated in figures 1 and 2, Distributed Architecture partitions messaging into zones with pairs of operating centres cooperating to process and store traffic for each zone.

5.1.3 Expected Impact

With Distributed Architecture, both FIN and SWIFTNet are active in each zone. This means that a partial failure of SWIFTNet or FIN in a zone, or the failure of a zone-specific operating centre, will only affect customers within that zone. There will be no impact on connectivity in the other zone. Intra-zone traffic in the unaffected zone is not impacted.

There will be an impact for traffic exchanged with users in the impacted zone, as messages are not delivered to those users from the time the failure occurs until the recovery is complete. For customers in the impacted zone, SWIFTNet and FIN system recovery time from the active to the standby operating centre, in case of the loss of a single operating centre is now 20 minutes. Total recovery time could be up to four hours depending on the cause of the failure, time to isolate failed components and time for management evaluation of the best course of action.

With the former architecture, a dual site failure required a cold start in the Disaster Recovery Infrastructure with loss of data. A cold start in the disaster recovery infrastructure takes about 10 hours. With Distributed Architecture, the failure of two operating centres, one in each zone, will not result in such a cold start scenario, but will instead cause a takeover of SWIFTNet and FIN to the standby global operating centre. Service restoration would require a maximum of four hours, including SWIFTNet and FIN system recovery time of 30 minutes once SWIFT has decided to move operations to the global operating centre. Customers should not expect the loss of any data in this scenario.

In the eventuality of a dual site failure for one of the messaging zones, which means that both the active and the standby operating centre have failed, the failed zone must also cold start in the disaster recovery infrastructure. Users in the other zone will continue to operate with the remaining operating centre.

Under certain circumstances, such as when a second failure occurs while SWIFT is working to restore service after an initial failure, the services levels described in this section may not apply. This would be the case for example in a zone cold-start scenario if the remaining operating centre fails before the zone cold start is complete. Such a scenario would increase service restoration time for the initial failed zone.

For additional information on the impact of a cold start, see section 6.

6 Cold start

6.1.1 Background

As noted in section 5, with the current architecture, a dual site failure requires a cold start in the disaster recovery infrastructure with loss of data. A cold start in the disaster recovery infrastructure takes about 10 hours.

6.1.2 Description

With distributed architecture, the failure of two operating centres, each in different zones, will cause a takeover of SWIFTNet and FIN to the standby global operating centre. Recovery time will be 30 minutes once the decision to move operations to the global operating centre has been taken.

In the eventuality of a dual site failure for one of the zones, which means that both the active and the standby operating centre have failed, the failed zone must also cold start in the disaster recovery infrastructure; this is the single zone cold start scenario. Users in the healthy zone will continue to operate with the remaining operating centre.

6.1.3 Expected Impact

As documented in the *FIN Service Description*, messages that were in the FIN systems prior to the cold start will no longer be available. Impacted users will therefore be required to take specific actions to handle traffic for which the delivery status is not clear. This includes all positively acknowledged messages that were in queue and awaiting delivery to the intended recipient. Users will need to resend such messages with a Possible Duplicate Emission (PDE) trailer once SWIFT has restored the FIN service.

This will affect all such traffic inside the affected zone. There will also be some impact on the inter-zone traffic. Although there will be no message loss for the healthy zone, users in that zone could see some availability impact.

SWIFT provides information to users to help them identify such traffic. SWIFT provides this information in the form of an MT 082 Undelivered Message Report at a Fixed Hour. This report now reflects the situation no more than 15 minutes before the event that lead to the cold start. Furthermore, SWIFT will modify the MT 082 to indicate that it is being sent in the context of a cold start. This will allow users operating BICs in both zones through a single hub to identify which MT 082 were sent due to a cold start.

All historic data related to earlier message receipt or message delivery by SWIFT will be lost for the cold started zone. SWIFT will reset input and output sequence numbers (ISN and OSN) to zero. In the case of a zone cold start, SWIFT will keep the continuity of session numbers. In the case of a global cold start, SWIFT will also reset the session number.

Users in the cold-started zone may receive messages with empty Possible Duplicate Message (PDM) trailers. These are messages for which delivery action was not completed prior to the zone cold start.

7 Country to zone allocation change process

7.1.1 Background

As described in sections 3.2 and 3.3, each country is assigned to one of the messaging zones. The current country to zone allocation can be consulted on www.swift.com in Knowledge Base tip number 2157180.

Country to zone allocation changes are allowed for all countries other than:

Countries in the European Economic Area (EEA), Switzerland and other territories and dependencies considered part of the European Union or associated with EU countries; these countries are assigned to, and must remain in, the European zone.

The United States and its territories; these countries and territories are assigned to, and must remain in, the Trans-Atlantic zone.

7.1.2 Change process

The change request process is as follows:

1. Changes must be requested by the National Member Group Chairperson or equivalent and must reflect the opinion of the majority of users within the country.

2. Change requests must be addressed to SWIFTSupport Service.

3. Country to zone allocation changes require advance notice. Once a valid change request has been received, SWIFT will respond to the requestor proposing an implementation date. The proposed implementation date will be within three months of the response under normal circumstances. If the technical assessment shows that some customer actions are required to correct a potential misalignment, such as a mismatch between a master and a synonym BIC, the impacted customer will be requested to make any changes required.

4. Change requests can be revoked up to one month before the planned change date. After this, it will no longer be possible to revoke the change which will go ahead as planned.

5. SWIFT will update the country to zone allocation information once the change has been ratified to provide advance information regarding the change.

End of document