

Confidential

**EUROPEAN
MONETARY
INSTITUTE**

INTERLINKING

User Requirements

Provided by the
Interlinking Project Team

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1. TABLE OF CONTENTS

1. TABLE OF CONTENTS	1
2. THE INTERLINKING SYSTEM AND GUIDELINES FOR ITS DEVELOPMENT	1
2.1 TARGET AND THE INTERLINKING SYSTEM	1
2.2 THE PARTICIPANTS IN THE INTERLINKING SYSTEM AND THEIR DIFFERENT ROLES.....	2
2.3 THE DEFINITION OF THE INTERLINKING SYSTEM.....	2
2.4 STRATEGY FOR THE DESIGN AND THE IMPLEMENTATION OF THE INTERLINKING SYSTEM	3
3. THE USER REQUIREMENTS FOLLOWING THE DIFFERENT FUNCTIONS OF THE INTERLINKING SYSTEM	1
3.1 GENERAL REMARKS CONCERNING APPLICATION SYSTEM ORIENTED FUNCTIONS	1
3.2 THE PAYMENT SYSTEM RELATED FUNCTIONS	1
3.2.1 <i>The status of payment data passed through the Interlinking components.....</i>	<i>1</i>
3.2.2 <i>Settlement between NCBs and the ECB.....</i>	<i>1</i>
3.2.3 <i>Provision of methods for message identification and error handling.....</i>	<i>1</i>
3.2.4 <i>The payment data message check.....</i>	<i>1</i>
3.2.5 <i>The handling of payments under special circumstances</i>	<i>2</i>
3.2.6 <i>The settlement of net settlement systems.....</i>	<i>2</i>
3.3 THE ACCOUNTING SYSTEM RELATED FUNCTIONS.....	2
3.4 END-OF-DAY CONTROL FUNCTIONS	2
3.5 THE COMMUNICATION FUNCTIONS OF THE INTERLINKING COMPONENTS	3
3.5.1 <i>General remarks.....</i>	<i>3</i>
3.5.2 <i>The transmission of data via telecommunication lines.....</i>	<i>3</i>
3.5.3 <i>The provision of matching data formats.....</i>	<i>3</i>
3.5.4 <i>The acknowledgement of data</i>	<i>3</i>
3.5.5 <i>Processing and transmission time within the Interlinking</i>	<i>4</i>
3.5.6 <i>Performance features</i>	<i>4</i>
3.6 AVAILABILITY FUNCTION	4
3.6.1 <i>General remarks.....</i>	<i>4</i>
3.6.2 <i>Minimum requirements concerning the availability.....</i>	<i>5</i>
3.7 SECURITY FUNCTIONS	5
3.7.1 <i>General remarks.....</i>	<i>5</i>
3.7.2 <i>The integrity, authenticity and non-repudiation of data during communication between NCBs or the ECB</i>	<i>5</i>
3.7.3 <i>Confidentiality and protection against unauthorised access to the data on the network level</i>	<i>6</i>
3.8 INTERFACE FUNCTIONS BETWEEN THE DOMESTIC RTGS SYSTEMS AND THE ECB SYSTEMS	6
4. THE CHANGE MANAGEMENT FOR USER REQUIREMENTS	1

2. THE INTERLINKING SYSTEM AND GUIDELINES FOR ITS DEVELOPMENT

2.1 TARGET and the Interlinking System

According to 'Minimum Common Features for Domestic Payment Systems' each national central bank (NCB) of the EU countries will have established a Real Time Gross Settlement (RTGS) system as soon as possible. The TARGET report subsequently states that those RTGS systems need to be linked together as soon as Stage III starts. The ECB itself will provide a payment mechanism to make payments on its own behalf, or on behalf of its few institutional customers.

The TARGET system is defined as a payment system composed of one RTGS system in each of the countries which participate in Stage III of EMU and the ECB payment mechanism. RTGS systems of non-participating countries may also be connected, provided that they are able to process the single common currency alongside the national currency. The RTGS systems and the ECB payment mechanism are interconnected to each other according to common procedures ('Interlinking') to allow payment orders to move from one system to another system.

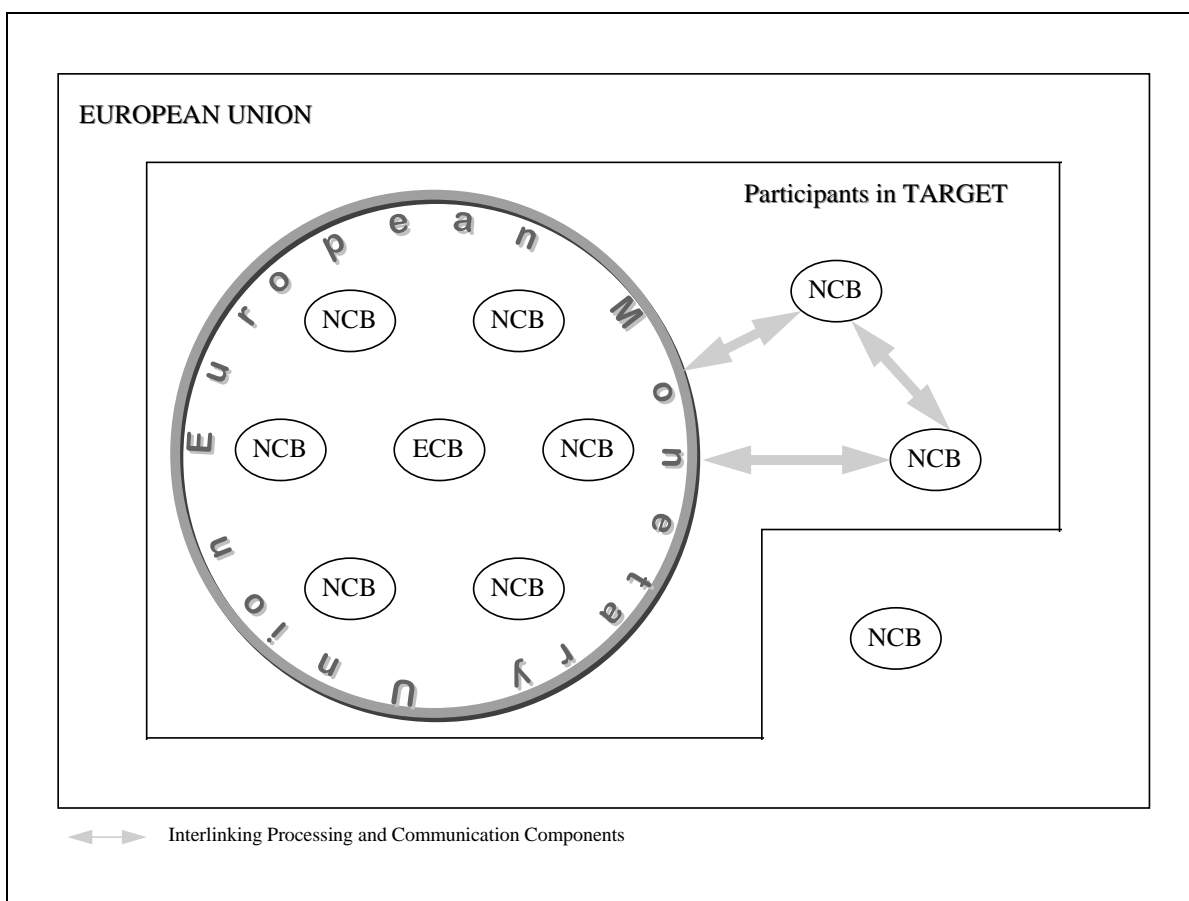


Figure 0-1 - TARGET

The specification and the realisation of the individual RTGS system is the responsibility of each NCB. The provision of the ECB payment mechanism is a task of the EMI.

2. THE INTERLINKING SYSTEM AND GUIDELINES FOR ITS DEVELOPMENT

The design of the functions needed for EU-wide interconnection and monitoring is a common task of the EMI and EU central banks for the analytical phase (functional requirements and design specification) and has to be realised as a common task by the individual NCBs and the EMI¹. The individual implementation of these functions can be done under separate responsibility either by integration within the RTGS systems and the ECB payment mechanism, or by implementing some or all functions in a separate subsystem.

2.2 The participants in the Interlinking System and their different roles

The only participants in the Interlinking System are the ECB and the NCBs.

For the exchange of payments, the ECB and the NCBs will use a common set of payment system and accounting functions as well as functions for settlement between NCBs.

2.3 The definition of the Interlinking System

The Interlinking System is composed of a set of processing functions at each NCB and the ECB². From this, the Interlinking contains the following functions:

- payment system related functions;
- accounting system related functions;
- communication functions of the Interlinking components;
- functions of availability and security;
- interface functions to the domestic RTGS systems, or in the case of the ECB, its payment mechanism.

The Interlinking will handle payments in the single common currency only, regardless of the currency that may be used in the domestic RTGS systems.³

¹ A separate responsibility could appear, if common network features or network services have to be provided. This matter is described within the proposal concerning the network service provider.

² Some or all functions may be provided by a third party. In this case, the NCB and/or the ECB is/are responsible for the compliance of the operator with the user requirements according to this document.

³ Even if national denomination is still used in the RTGS systems of the participating countries, these systems will have to provide a conversion feature for further handling in the Interlinking.

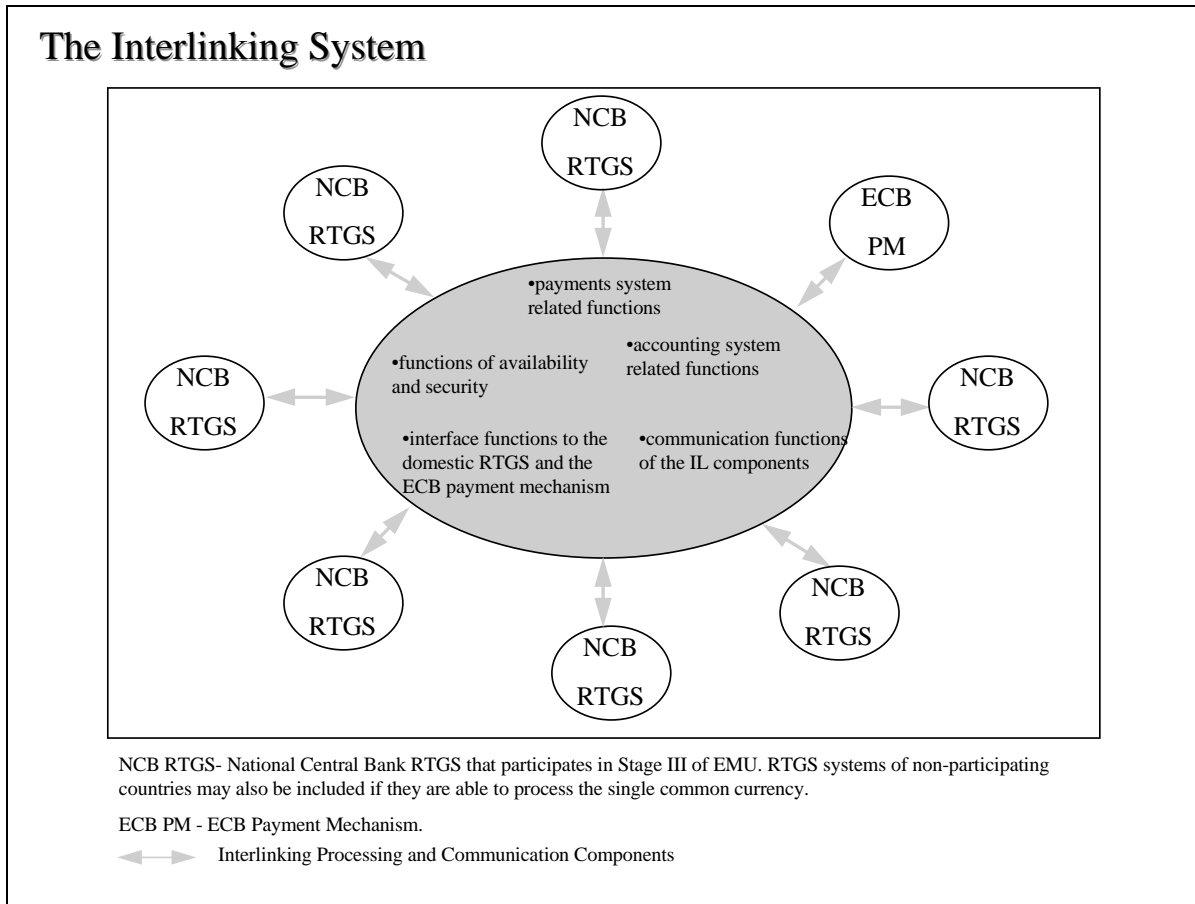


Figure 0-2 - The Interlinking System

2.4 Strategy for the design and the implementation of the Interlinking System

It is an objective to design and implement the Interlinking System in time for the start of Stage III. As a minimum, sufficient functionality should be available by then.

The design should make sure that adding new central banks and/or new facilities is possible in a structured way so that it does not necessarily complicate the design or introduce new programme risks. Therefore, the interface between the different systems involved should be well defined and follow agreed (international) standards as much as possible. As a minimum, the following should be guidelines for the design:

- message orientated exchange of payments (item by item);
- SWIFT formats as a basis for the data exchange inside the Interlinking.

3. THE USER REQUIREMENTS FOLLOWING THE DIFFERENT FUNCTIONS OF THE INTERLINKING SYSTEM

3. THE USER REQUIREMENTS FOLLOWING THE DIFFERENT FUNCTIONS OF THE INTERLINKING SYSTEM

3.1 General remarks concerning application system oriented functions

For analytical reasons (not as a guideline for the implementation), the payment system related functions and the accounting functions will be defined as a separate component at each NCB and the ECB. This logical system receives input data; processes these data and provides output data. Each NCB and the ECB have to provide adequate functions within their Interlinking component. This means user requirements for this 'logical system' can be defined independently from the 'physical' infrastructure at each NCB and the ECB.

This approach allows the definition of application system oriented user requirements independently from the existing IT and payment systems infrastructure at the different NCBs and at the ECB. Furthermore, this method facilitates a clear view on these requirements and should give the NCBs and the ECB a high level of flexibility for implementation.

3.2 The payment system related functions

3.2.1 The status of payment data passed through the Interlinking components

Payment data transmitted across the Interlinking System will represent payments, expressed in the single common currency, that have been finally and irrevocably debited from the account of the bank of the originator in the originating national RTGS system.

3.2.2 Settlement between NCBs and the ECB

Participating NCBs and the ECB will not impose intra-day credit limits on each other which could impede the execution of payments⁴. The settlement procedure will be defined at a later stage.

3.2.3 Provision of methods for message identification and error handling

Each payment passing through the Interlinking must have a unique identifier to facilitate message identification and error handling.

3.2.4 The payment data message check

The sending NCB/ECB has to check the syntax of the data according to the appropriate standard, the value date of the payment order (the check that it is same day⁵) and the

⁴ This section has been drafted under the assumption that no credit limits restrict the exchange of payments. The introduction of intra day credit lines would create a need for further user requirements and hence increase the complexity of the system.

⁵ The value date is a feature of some domestic RTGS systems. The only value date of the Interlinking System is 'today'.

3. THE USER REQUIREMENTS FOLLOWING THE DIFFERENT FUNCTIONS OF THE INTERLINKING SYSTEM

availability of the receiving NCB/ECB. If syntax errors, or other reasons for rejection are detected, the sending NCB/ECB should handle the data according to domestic rules⁶.

The receiving NCB/ECB has to check all necessary parts for successfully crediting of the account of the beneficiary bank in line with its own national provisions (including a unique identifier to avoid double crediting).

3.2.5 The handling of payments under special circumstances

By means of a negative acknowledgement, the receiving NCB/ECB will immediately inform the sending NCB/ECB about the impossibility of crediting the beneficiary, stating the reason for not executing the payment. The reasons can be:

- impossible to identify the receiving institution;
- other problems stemming from the content of the message;
- unavailability of the receiving system.

The sending NCB/ECB should handle the data according to domestic rules⁶.

3.2.6 The settlement of net settlement systems

The Interlinking System will offer, on an optional basis, a service to settle balances arising from net-settlement systems with a strong cross border basis (the ECU clearing for example). For this purpose it has to provide a function that supports this service and affects domestic RTGS systems as little as possible.

3.3 The accounting system related functions

To meet the technical needs for the daily processing of payments, each participating NCB will open one account for each NCB and the ECB. The ECB will open accounts for all NCBs.

3.4 End-of-day control functions

At the end of the day, but before final closing of the Interlinking System, each NCB provides to the ECB a message with end of day information to check whether all payment messages were exchanged correctly.

The end of day control procedures have to be finalised by a positive answer from the ECB. In the case of a negative answer, the relevant NCBs/ECB have to initiate and finalise error detection procedures within thirty minutes (i.e. the standard end of day operation time).

No participating NCB may end its TARGET business day before it has established final positions with its bilateral partners⁷.

⁶ The sending NCB may decide, for example, to re-credit the account of the originator and re-route the data or to credit an offset account for correcting the payment data and repeat the transmission via the Interlinking.

⁷ If the reason for a discrepancy is a purely technical one, and has no impact on a secure finalisation of the business day, NCBs/ECB could decide to end the business day and solve the technical problem 'off-line'.

3. THE USER REQUIREMENTS FOLLOWING THE DIFFERENT FUNCTIONS OF THE INTERLINKING SYSTEM

3.5 The communication functions of the Interlinking components

3.5.1 General remarks

With the exception of two features, communication functions can be described within the 'logical' approach used in the preceding section. By contrast to the 'logical' Interlinking functions, processing and transmission times have a strong link to TARGET as a whole. To provide a clear definition of what is required within TARGET as a whole, it is appropriate to define processing and transmission times by reference to events within the settlement process (debiting and crediting).

However, those requirements that go beyond the linkage of domestic systems will be defined only to have a clear view on TARGET as a whole. They do not create additional requirements for the Interlinking. The Interlinking requires only the communication that takes place between NCBs or the ECB.

3.5.2 The transmission of data via telecommunication lines

To fulfil 'real time requirements of the TARGET system', the transmission of payment data in the Interlinking System must be done via telecommunication lines.

3.5.3 The provision of matching data formats

If domestic formats deviate from Interlinking standardised formats, the Interlinking component has to be able to handle full incoming standardised Interlinking payment messages and to convert them if necessary into a domestic data presentation. If domestic formats deviate from Interlinking standardised formats (see 2.4), the domestic Interlinking component has to convert outgoing domestic data formats into the standardised data presentation used in the Interlinking.

National central banks or their operators will be expected to handle incoming Interlinking messages like SWIFT MT 202 or MT 100.

The Interlinking component at each NCB has to be able to create and to transmit standardised messages for further services (handling of errors, end of day message check, transmission of management information data etc.).⁸

3.5.4 The acknowledgement of data

The receiving NCB/ECB has to send an automatically generated acknowledgement to the sending NCB/ECB for each payment message received.

If the crediting of the beneficiary bank in the RTGS system is successfully completed, the acknowledgement will be positive. If an error occurs during processing and the processing cannot be completed, a negative acknowledgement will be sent to the sending NCB/ECB stating the reason.

⁸ Message types and content of the message types will have to be investigated in depth at a later stage. The Interlinking message types could stay within the FIN message definition if the maximum size of single messages is less than or equal to 10000 characters (free formatted message).

3. THE USER REQUIREMENTS FOLLOWING THE DIFFERENT FUNCTIONS OF THE INTERLINKING SYSTEM

Responsibility for the payment is only passed over to the receiving NCB/ECB following the reception of a positive acknowledgement from the receiving NCB/ECB. For the sender, a positive acknowledgement is the proof of receipt and successful crediting of the beneficiary bank's account in the receiving NCB/ECB.

If an acknowledgement has not arrived within 30 minutes⁹ after the debiting has taken place, the sending NCB has to start with error detecting procedures.

3.5.5 Processing and transmission time within the Interlinking

The standard time for message to 'travel' through the Interlinking System (transmission between Interlinking communication components) will be estimated to be under ten seconds for 99 per cent of transactions per day and less than 15 minutes for the remaining transactions (under normal situations).^{10 11}

3.5.6 Performance features

The performance of the Interlinking components including the interface between the domestic Interlinking component and the RTGS system/ECB payment mechanism has to be sufficient to support the processing time mentioned above.

The design of the performance depends mainly on the number of payments that will have to be processed. The data flow will have to be investigated carefully, to provide figures for the design of the system.

3.6 Availability function

3.6.1 General remarks

The user requirement related to availability describes either the minimum amount of processing required in a given time span or the maximum time span allowed to process all transactions. For systems like TARGET or the Interlinking, this availability function should describe comprehensively what is needed (including contingency situations)¹².

⁹ 30 minutes should be considered as a maximum time that could be lowered, according to experience.

¹⁰ The figures in this paragraph should be seen as objectives. Especially if a service provider would be chosen, this may have huge effects on costs. Hence, the trade off between speed and costs will be investigated carefully and these provisions may have to be revised.

¹¹ The processing and transmission time from one RTGS system to another RTGS system (which is not an Interlinking requirement) were also defined by the Interlinking Task Force. It has been proposed that this should be the sum of the time required in the sending and the receiving RTGS system including the communication between the RTGS system and the domestic Interlinking component (each 7.5 minutes) plus Interlinking time as defined above, i.e. a total max. time 30 minutes (this definition covers the time taken between debiting of the account of the ordering bank by the sending RTGS system until the crediting of the account of the beneficiary bank at the receiving NCB).

¹² In the user requirements, a distinction will be made between normal processing, contingency processing and a disaster. A contingency situation is any kind of situation in which defined standard time schedules are exceeded but where the system as a whole can continue to work after a delay time (e.g. switch to a back up system after the distortion of a processing system). By contrast, a 'disaster' means that the recovery time is not foreseeable (e.g. earthquake, nuclear bomb). These requirements deal only with contingency situations. The line between a contingency situation and a disaster will have to be defined more precisely at a later stage.

3. THE USER REQUIREMENTS FOLLOWING THE DIFFERENT FUNCTIONS OF THE INTERLINKING SYSTEM

This section deals with availability features of the Interlinking. In addition, availability features for TARGET as a whole are necessary. As indispensable framework, criteria for the finalisation of the TARGET business day will be defined in this section.

3.6.2 Minimum requirements concerning the availability

In addition to the processing and transmission time that was already described, the different systems involved have to fulfil the following criteria:

In the case of a distortion of the network (including the sending and receiving systems in the NCBs and the ECB) recovery measures have to ensure that a contingency link with an adequate capacity is available within four hours.

In addition, TARGET as a whole has to provide facilities capable of completing the business day in a final and irrevocable way before the start of the next one (i.e. before the opening time of domestic RTGS systems on the next business day), and to provide a sufficient infrastructure to conduct the next business day¹³.

3.7 Security functions

3.7.1 General remarks

Payment systems using several computers and several communication links are to a large extent no stronger than the weakest component within this chain.

Security features of the Interlinking system have to meet a certain security level that must be defined for TARGET as a whole. Within TARGET a distinction can be drawn between different areas of responsibility that are linked by well defined security methods (integrity, authenticity and non repudiation).

Given this background, a minimum common standard for the network and certain domestic areas could be appropriated. By contrast to this, the user requirement could be restricted to the security on the network and the mechanism that secures non-repudiation.

This section follows the comprehensive approach. Security levels will be defined for all areas. It is a task of the NCBs, and the EMI on behalf of the ECB, to design and implement an adequate security level in their own areas of responsibility.

3.7.2 The integrity, authenticity and non-repudiation of data during communication between NCBs or the ECB

The methods used for communication between Interlinking components will have to provide features against the threat to integrity, authentication and non-repudiation. These methods have to be designed so as not to be compromised and not to be compromisable

¹³ Because NCBs, and the EMI on behalf of the ECB, are free to implement Interlinking application functions within domestic RTGS systems or in a separate module, the Interlinking user requirements do not provide a definition of availability criteria for domestic Interlinking components. This is more than an Interlinking requirement. The implication of this need will have to be investigated carefully for the RTGS systems and for TARGET as a whole.

3. THE USER REQUIREMENTS FOLLOWING THE DIFFERENT FUNCTIONS OF THE INTERLINKING SYSTEM

in the foreseeable future. They have to be implemented and monitored in a way that makes sure that they will be used in a proper way.

3.7.3 Confidentiality and protection against unauthorised access to the data on the network level

Payment data that are communicated between Interlinking components at different NCBs/ the ECB payment mechanism have to meet an appropriate level of protection against the loss of confidentiality. These methods have to be designed so as not to be compromised and not to be compromisable in the foreseeable future. They have to be implemented and monitored in a way that makes sure that they will be used in a proper way.

3.8 Interface functions between the domestic RTGS systems and the ECB systems

The NCBs and the ECB have to provide adequate interfaces to the domestic RTGS system or the ECB system to achieve a sufficiently fast and secure communication between these components in line with the requirements stated in this chapter¹⁴.

¹⁴ This solution gives maximum independence for implementation to the NCBs and to the EMI on behalf of the ECB. However, a higher level of harmonisation might be required for TARGET as a whole.

4. THE CHANGE MANAGEMENT FOR USER REQUIREMENTS

The user requirements will be the only binding reference paper for further steps of the project.

Each NCB and the EMI can make proposals for additions and changes in the user requirements. Proposals will be evaluated by the responsible entities and will have to be formally approved by the EMI Council or in less important matters by the WGPS.

No changes should be designed or implemented before the proposal to amend the user requirement is approved.

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INTERLINKING

Specifications

Provided by the

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0. RELEASE NOTES

In order to follow the current status of all chapters of this document, we provide you with the following matrix. The numbers mentioned in the column 'Rel.No.' refer to the current version of the chapter.

Chapter	Status ¹	Number of pages	Date	Rel.No.
0	Final	1	26 SEP 97	1.30
1	Final	4	26 SEP 97	1.30
2	Final	8	26 SEP 97	1.30
3	Final	3	26 SEP 97	1.30
4	Final	11	26 SEP 97	1.30
5	Final	13	26 SEP 97	1.30
6	Final	20	26 SEP 97	1.30
7	Final	1	26 SEP 97	1.30
8	Final	7	26 SEP 97	1.30
9	Final	1	26 SEP 97	1.30
10	Final	7	26 SEP 97	1.30
11	Final	1	26 SEP 97	1.30

¹ Open: the chapter is foreseen, but currently empty. No special comment is required.
 Draft: the chapter has been drafted. Comments are required.
 Final: the chapter has been agreed by the TTF.

1. TABLE OF CONTENTS

0. RELEASE NOTES.....	1
1. TABLE OF CONTENTS.....	1
2. INTERLINKING SYSTEM OVERVIEW.....	1
2.1 THE BACKGROUND AND THE SCOPE OF THE SPECIFICATIONS	1
2.2 DESIGN STRATEGY AND METHODOLOGY FOR THE EXCHANGE OF INFORMATION	1
2.2.1 <i>Design strategy</i>	1
2.2.2 <i>Methodology for the exchange of information</i>	2
2.2.2.1 Classification of messages for Interlinking purposes:	3
2.2.2.2 Message framework within the S.W.I.F.T. FIN service:	3
2.2.2.3 Interlinking Internal Referencing	3
2.3 THE PHYSICAL AND LOGICAL INFRASTRUCTURE OF THE SYSTEM	3
2.3.1 <i>Network and processing infrastructure</i>	3
2.3.2 <i>Accounting infrastructure</i>	3
2.4 THE BUSINESS FUNCTIONS OF THE SYSTEM.....	3
2.4.1 <i>Cross-border single payment transfers</i>	3
2.4.2 <i>Settlement of net settlement systems</i>	3
2.4.3 <i>End-of-day Control Operations</i>	3
2.5 ENSURING AVAILABILITY, SECURITY AND MINIMUM CAPACITY.....	3
2.5.1 <i>Availability</i>	3
2.5.2 <i>Security</i>	3
2.5.3 <i>Minimum capacity</i>	3
2.6 RESPONSIBILITIES	3
2.6.1 <i>Interlinking communication functions</i>	3
2.6.2 <i>Interlinking business functions</i>	3
2.7 CURRENT STAGE OF THE SPECIFICATION PROCESS AND OPEN ISSUES	3
3. THE BACKGROUND AND SCOPE OF THE SPECIFICATIONS.....	3
3.1 TARGET AND THE INTERLINKING	3
3.2 SCOPE OF THE INTERLINKING SPECIFICATION	3
3.3 INTERLINKING SPECIFICATIONS AND USER REQUIREMENTS	3
3.4 INTERLINKING SPECIFICATIONS WITHIN EXISTING INFRASTRUCTURE.....	3
3.5 INTERLINKING SPECIFICATION, OPERATIONAL RULES AND USER HANDBOOK	3
4. DESIGN STRATEGY AND METHODOLOGY FOR THE SYSTEM.....	3
4.1 DESIGN STRATEGY	3
4.1.1 <i>The User Requirement references</i>	3
4.1.2 <i>Structured design</i>	3
4.1.3 <i>Building the system on decentralised individual RTGS systems and existing network infrastructure</i>	3
4.1.4 <i>Flexibility and independence</i>	3
4.1.4.1 Distinction between communication functions and business application functions	3
4.1.4.2 Structured and secure communication.....	3
4.1.4.3 Message policy	3
4.1.5 <i>New functions within the existing infrastructure</i>	3
4.2 METHODOLOGY FOR THE EXCHANGE OF INFORMATION	3
4.2.1 <i>The User Requirement references</i>	3
4.2.2 <i>Classification of messages</i>	3
4.2.3 <i>The use of a message framework</i>	3
4.2.4 <i>The Request messages</i>	3
4.2.4.1 The Payment Settlement Message Request (PSMR).....	3
4.2.4.2 The End-of-day Check Message Request (ECMR).....	3
4.2.4.3 The Delay Closing Time Request (DCTR)	3
4.2.5 <i>The Notifications</i>	3

4.2.5.1 The Payment Settlement Message Notification (PSMN)	3
4.2.5.2 The End-of-day Check Message Notification (ECMN)	3
4.2.5.3 The Delay Closing Time Notification (DCTN).....	3
4.2.6 <i>The General Purpose Messages (GPM)</i>	3
4.2.7 <i>Message referencing</i>	3
4.2.8 <i>The resending of messages</i>	3
5. THE PHYSICAL AND LOGICAL INFRASTRUCTURE OF THE SYSTEM.....	3
5.1 TECHNICAL COMPONENTS AND INTERFACES	3
5.1.1 <i>The User Requirement references</i>	3
5.1.2 <i>Network topologies for domestic RTGS systems' components and Interlinking components</i>	3
5.1.2.1 RTGS Communication Component.....	3
5.1.2.2 Processing Components: RTGS Processing Component and Interlinking Processing Component	3
5.1.2.3 Interlinking Communication Component	3
5.1.3 <i>The interfaces between components</i>	3
5.1.4 <i>Topologies</i>	3
5.1.4.1 V-shaped topology	3
5.1.4.2 Y-shaped topology	3
5.1.4.3 L-shape topology	3
5.1.5 <i>The link between different topologies and their interfaces</i>	3
5.1.5.1 The link between different topologies	3
5.1.6 <i>Standard and Contingency features of the Processing and communication components</i>	3
5.1.6.1 The User Requirement references	3
5.1.6.2 Structure of the required components.....	3
5.1.7 <i>Confidentiality, Integrity, Authentication and non-repudiation - interface of the components</i>	3
5.1.7.1 The User Requirement references	3
5.1.7.2 Structure of the required components.....	3
5.1.7.2.1 Encryption.....	3
5.1.7.2.2 Authentication.....	3
5.1.7.2.3 Integrity	3
5.1.7.2.4 Non-repudiation	3
5.1.8 <i>Performance features of the components and the interfaces</i>	3
5.1.8.1 The User Requirement references	3
5.1.8.2 Performance of the network	3
5.1.8.3 Performance of the domestic components	3
5.2 ACCOUNTING FRAMEWORK FOR THE INTERLINKING	3
5.2.1 <i>The User Requirement references</i>	3
5.2.2 <i>Accounting functions related to the Interlinking</i>	3
5.2.3 <i>The provision of intraday liquidity</i>	3
6. THE BUSINESS FUNCTIONS OF THE SYSTEM	3
6.1 CROSS-BORDER SINGLE PAYMENT TRANSFER	3
6.1.1 <i>The User Requirement references</i>	3
6.1.2 <i>The functions of the cross-border single payment transfer</i>	3
6.1.3 <i>Settlement message flow</i>	3
6.1.3.1 Payments between Credit Institutions	3
6.1.3.2 Payments between the NCBs/ECB and credit institutions	3
6.1.3.3 Payments between the NCBs/ECB.....	3
6.1.3.4 Normal procedure.....	3
6.1.3.5 Negative notification	3
6.1.3.6 Notification not received.....	3
6.1.4 <i>Message types</i>	3
6.1.4.1 MT198 sub 100 - Customer Transfer	3
6.1.4.1.1 Scope.....	3
6.1.4.1.2 General Format	3
6.1.4.2 MT198 sub 202 - General Financial Institution Transfer	3
6.1.4.2.1 Scope.....	3
6.1.4.2.2 General Format	3
6.1.4.3 MT198 sub 110 - Payment Settlement Message Notification (PSMN)	3
6.1.4.3.1 Scope.....	3
6.1.4.3.2 General Format	3
6.2 SETTLEMENT OF NET-SETTLEMENT SYSTEMS	3
6.2.1 <i>The User Requirement references</i>	3

6.2.2	<i>The settlement service for net-settlement systems</i>	3
6.3	END-OF-DAY CONTROL OPERATIONS	3
6.3.1	<i>The User Requirement references</i>	3
6.3.2	<i>The function of the end-of-day control operation</i>	3
6.3.3	<i>Flow of messages</i>	3
6.3.3.1	The procedures	3
6.3.3.2	The notification	3
6.3.3.2.1	Unsuccessful matching	3
6.3.3.2.2	Open matching	3
6.3.4	<i>Message types</i>	3
6.3.4.1	MT198 sub 111 - The End-of-day Check Message Request (ECMR)	3
6.3.4.1.1	Scope	3
6.3.4.1.2	Message format	3
6.3.4.2	MT198 sub 112 - The End-of-day Check Message Notification (ECMN)	3
6.3.4.2.1	Scope	3
6.3.4.2.2	Message format	3
6.4	DELAY CLOSING TIME OPERATIONS	3
6.4.1	<i>The procedures</i>	3
6.4.2	<i>Message types</i>	3
6.4.2.1	MT198 sub 113 - Delay Closing Time Request (DCTR)	3
6.4.2.1.1	Scope	3
6.4.2.1.2	Message format	3
6.4.2.2	MT198 sub 114 - Delay Closing Time Notification (DCTN)	3
6.4.2.2.1	Scope	3
6.4.2.2.2	Message format	3
6.5	GENERAL PURPOSE MESSAGES	3
6.5.1	<i>Message types</i>	3
6.5.1.1	MT198 sub 115 - Interlinking Free Format Message (IFFM)	3
6.5.1.1.1	Scope	3
6.5.1.1.2	Message format	3
6.6	THE FUNCTION TO RESEND OF MESSAGES	3
6.7	THE FUNCTION TO SIMULATE NOTIFICATIONS	3
6.8	THE FUNCTION TO STOP SENDING PAYMENTS	3
7.	ENSURING AVAILABILITY, SECURITY AND MINIMUM CAPACITY	3
8.	RESPONSIBILITIES	3
8.1	RTGS SYSTEMS AND THE INTERLINKING WITHIN TARGET	3
8.2	RESPONSIBILITY OF THE NCBS/ECB AND S.W.I.F.T	3
8.2.1	<i>Communication functions</i>	3
8.2.1.1	Availability of systems and link facilities	3
8.2.1.2	Physical and logical access control	3
8.2.1.3	Message delivery	3
8.2.1.4	Data confidentiality during communication	3
8.2.1.5	Data integrity	3
8.2.1.6	Data authenticity	3
8.2.1.7	Non-repudiation between sending NCB/ECB and receiving NCB/ECB	3
8.2.1.8	Tools for a secure authentication key exchange	3
8.2.2	<i>Business application functions</i>	3
9.	OPEN DESIGN ISSUES AND THE CURRENT STAGE OF THE SPECIFICATION PROCESS	3
9.1	OPEN DESIGN ISSUES	3
9.1.1	<i>The settlement of Net Settlement systems</i>	3
9.1.2	<i>Volume of transactions</i>	3
9.1.3	<i>TARGET message pricing</i>	3
9.1.4	<i>Error handling procedures</i>	3
9.1.5	<i>End-to-end confidentiality</i>	3
9.1.6	<i>The relationship between non-euro area NCBs within EU</i>	3
9.2	CURRENT STAGE OF THE SPECIFICATION PROCESS	3
10.	GLOSSARY OF TERMS	3

11. LIST OF FIGURES 3

2. INTERLINKING SYSTEM OVERVIEW

2.1 THE BACKGROUND AND THE SCOPE OF THE SPECIFICATIONS

In keeping with the Maastricht Treaty, **TARGET (Trans-European Automated Real-Time Gross Settlement Express Transfers)** will be a decentralised system with only some common functions undertaken by the European Central Bank (ECB).

For these purposes:

- Domestic RTGS systems will retain their specific features to the maximum extent compatible with the single ESCB monetary policy and a level playing field for credit institutions.
- Linkages will be established between national real-time gross settlement systems (RTGS) and with the ECB Payment Mechanism (ECB-P). These linkages (the Interlinking System), together with the national RTGS systems and the ECB-P, will form the TARGET system. TARGET will only process payments in euro.

Starting from these principles, the detailed business design was made. In this process:

- the 'Minimum common performances features of RTGS systems within TARGET' was developed; and
- the 'Interlinking User Requirements' were elaborated.

They are the basis for the technical design of common elements of NCBs and the ECB in TARGET.

To have a secure basis for the detailed design of the Interlinking, within the framework of the TARGET report, the NCBs and the EMI on behalf of the ECB, elaborated common User Requirements for the Interlinking System.

The Interlinking Specifications set out the procedures for the implementation of the Interlinking System and describes the technical solution that fulfils the User Requirements.

The implementation of these functions will be the separate responsibility of each NCB, and the EMI on behalf of the ECB.

2.2 DESIGN STRATEGY AND METHODOLOGY FOR THE EXCHANGE OF INFORMATION

2.2.1 Design strategy

The TARGET design takes into account the decentralised structure of the system.

The design strategy is illustrated in the following figure:

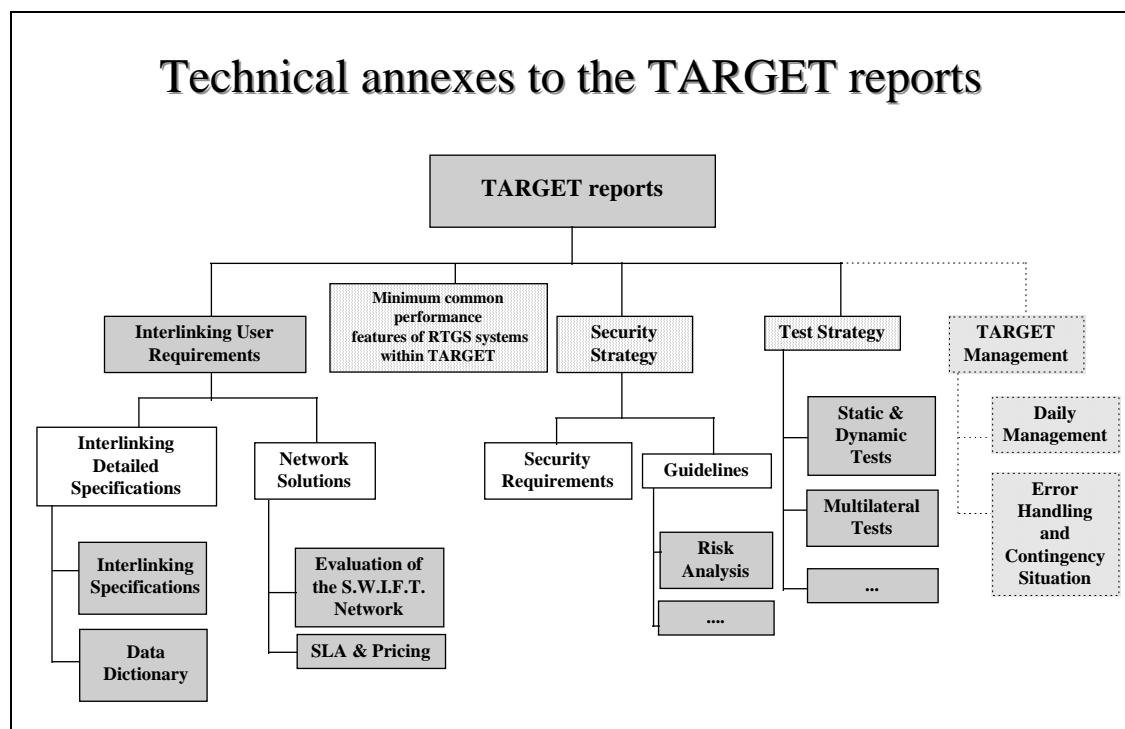


Figure 0-1 - Technical annexes to the TARGET report

Within the above design strategy it was decided to use the existing S.W.I.F.T. FIN system as a communication network for the Interlinking for several reasons, in particular to cope with the tight time schedule for TARGET. S.W.I.F.T. FIN is already used by all central banks and the EMI.

However, to be open to potential future requirements in the fast developing market of large-value payment services and to minimise dependence on the network provider, TARGET is technically built on three pillars:

- Application oriented functions (e.g. payment system functions) are clearly separated from network functions (e.g. data transmission, message authentication).
- A logical communication structure following strictly the message oriented concept of the system is designed.
- The message policy supports a maximal independence from S.W.I.F.T. -formats but allows them to be used as a basis.

Furthermore, a comprehensive strategy for security issues and testing was elaborated.

The strategic guidelines for the Interlinking can be summarised as flexibility and independence.

2.2.2 Methodology for the exchange of information

To comply with the previous design strategy, the Interlinking Specifications use the following methodology:

2.2.2.1 Classification of messages for Interlinking purposes:

- The **Request Messages**. Messages used when a defined action from the receiving NCB/ECB is required. Typical messages of this type will be payment messages (which require an acknowledgement) and end-of-day messages to the ECB (which require a matching notification).
- The **Notification Messages**. The messages in this category are replies to requests. The notifications (or acknowledgements) can be either positive (ACK) or negative (NACK). A notification completes the communication cycle initiated by a request.
- The **General Purpose Messages (GPM)**. These are informative plain text messages. GPMs can be either broadcast to many NCBs/ECB or sent to a single destination. For example, the ECB can send a message to warn an NCB that it has not received end-of-day information at the required time. GPMs do not require a notification.

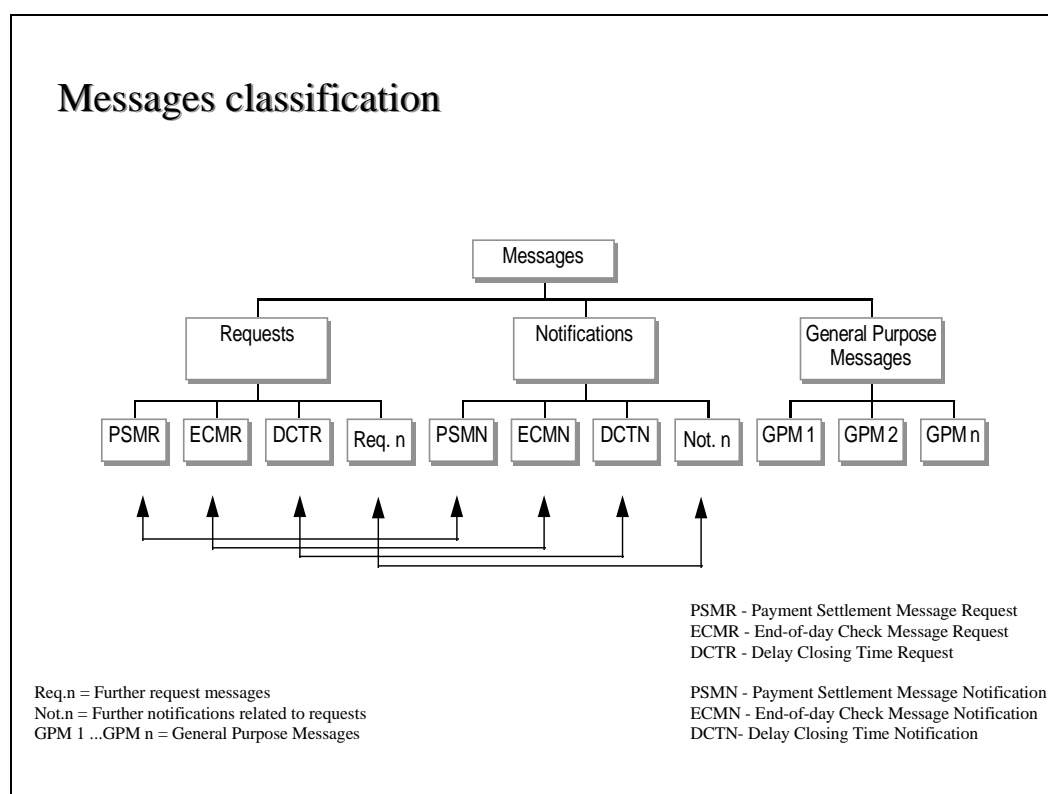


Figure 0-2 - Messages classification

2.2.2.2 Message framework within the S.W.I.F.T. FIN service:

- The S.W.I.F.T. messaging system is used as a technical envelope in which the Interlinking data is transmitted.
- Such a framework gives total flexibility over the use of current data formats, the provision of confidentiality and the evolution of the data formats. For payment system purposes it is envisaged to use subsets of what are currently the most common used S.W.I.F.T. message types: MT100 and MT202. For specific Interlinking messages a specific 'Interlinking design' has been made.

2.2.2.3 Interlinking Internal Referencing

- In the Interlinking, there is a need for unique numbering on a bilateral basis, closely related to the payment system functions of the system (independent from S.W.I.F.T.'s referencing which is directly related to the network).

2.3 THE PHYSICAL AND LOGICAL INFRASTRUCTURE OF THE SYSTEM

2.3.1 Network and processing infrastructure

Since RTGS systems are implemented differently in each member state, the approach to the design of the Interlinking components tries to be as flexible as possible. Three types of RTGS topologies (V-shape, Y-shape, L-shape) currently exist and may have to operate within the TARGET framework. Because they are differently structured and operate on different computer systems, the common design ends at the functional level.

Hence, technically the Interlinking is the link between different IT-infrastructures at the NCBs and the ECB or operators who work on their behalf. The link between the different systems takes place via the Interlinking infrastructure which support a unique communication interface.

The common element of all these structures is that they provide an agreed set of logical RTGS and Interlinking functions:

- **RTGS communication functions;**
- **RTGS processing functions;**
- **Interlinking communication functions; and**
- **Interlinking processing functions.**

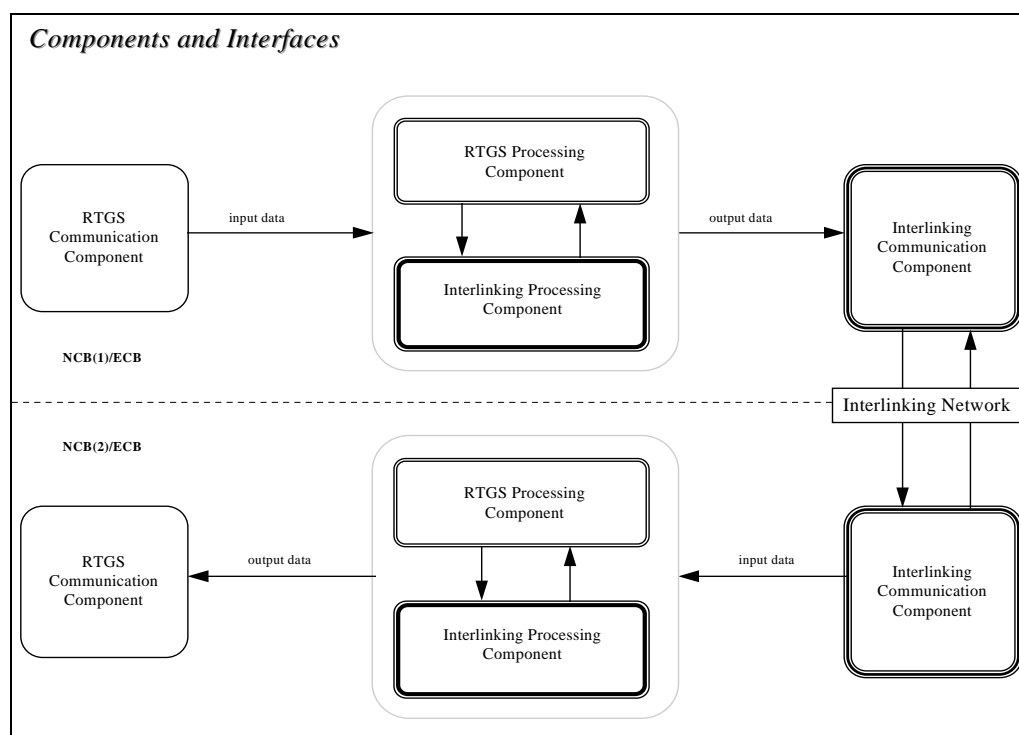


Figure 0-3 - Components and Interfaces

2.3.2 Accounting infrastructure

From an Interlinking point of view, the accounting systems of the NCBs and the ECB will be the logical business framework for the cross border exchange of payments. Two accounting functions are to be provided in TARGET:

- Irrevocable and final debiting and crediting of payment (RTGS function);
- Record keeping on inter-NCB/ECB accounts (Interlinking function).

Irrevocable and final debiting² creates a sound basis for the secure crediting of the cross border payment in another RTGS system. The intra-day record keeping on inter-NCB accounts is required for the successful conduct of end-of-day operations.

2.4 THE BUSINESS FUNCTIONS OF THE SYSTEM

2.4.1 Cross-border single payment transfers

Following strictly the logic of RTGS system processing, where payment orders are processed item by item, the Interlinking uses a processing cycle, which is directly linked to each single payment message. Once payments are irrevocably and finally debited², they are forwarded via the Interlinking. The following figure describes a complete message handling process:

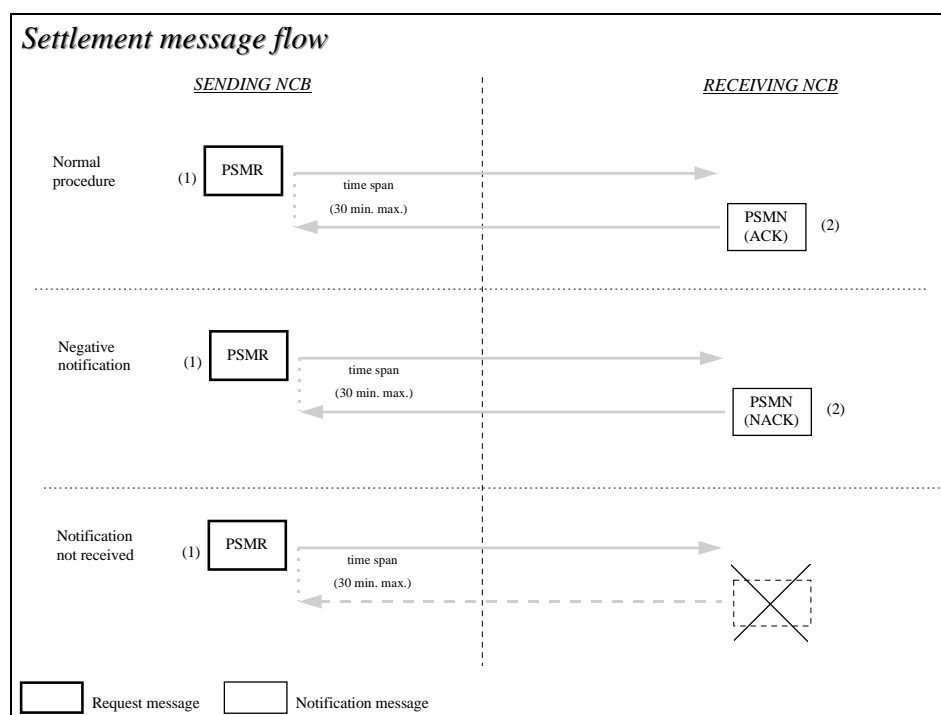


Figure 0-4 - Settlement message flow

In the case of normal processing, a positive acknowledgement (after crediting the amount sent in the receiving RTGS-system) or a negative acknowledgement, stating the reason for rejection, will be sent to the sending NCB/ECB. If it does not arrive within 30

² Other equivalent methods are not excluded (e.g. blocking and debiting after the crediting).

minutes³, the sending NCB/ECB which is, in this case, still responsible for the payment, has to start error detection procedures.

TARGET is designed for making payments between credit institutions. Furthermore, the Interlinking and RTGS systems will be used for making payments between NCBs/ECB and credit institutions and for payments between NCBs/ECB.

2.4.2 Settlement of net settlement systems

Given the fact that at the start of Stage Three a net-settlement system (i.e. the euro clearing system) will exist with participants that hold their accounts (which are needed for settlement) in different RTGS systems, the ESCB needs a mechanism to allow the settlement of the net balances of the participants. To meet this requirement, the following settlement mechanism has been agreed as far as the EBA Clearing is concerned:

The ECB will open in its books a central settlement account in the name of the EBA. Moreover, one or few NCBs may, if they so wish and in agreement with the EBA, open in their books a local settlement account to the EBA.

Net debtors in the EBA Clearing will settle their end-of-day position by sending payment orders to their respective account-keeping NCBs, through the local RTGS system, which would debit their accounts. TARGET would be used to channel the funds to the ECB holding the central settlement account of the EBA. However, net debtors located in a country where the NCB has opened a local settlement account to the EBA will send a local RTGS payment order for the benefit of that local EBA settlement account.

Once all net debtors have paid the amounts due, liquidity will be shifted between the central settlement account of the EBA at the ECB and the local settlement accounts of the EBA (where they exist) so as to provide these accounts with the money necessary to pay out the banks with a net credit position (long banks).

Long banks will be paid out from the settlement account of the EBA at the ECB via cross-border TARGET payment or, to the extent that they are located in a country where the NCB has opened a local settlement account to the EBA, from that local settlement account via a domestic RTGS system.

2.4.3 End-of-day Control Operations

Having in mind the general design of the Interlinking network, particularly in relation to the function of acknowledgements, the end-of-day control operations will ensure, on a technical basis, that all bilateral operations conducted during the day match each other. It will perform the following controls:

- check that the last IIR sent by an NCB/ECB to another NCB/ECB has been received and vice versa;
- check that the total credit turnover and the total debit turnover of the cross-border payments positively acknowledged between the NCBs/ECB during the business day match each other.

³ 30 minutes should be seen as a maximum for the starting phase of the system. Later improvements may be possible.

These controls will be performed by the ECB. Successful completion of the end-of-day message check is the last action taken in the Interlinking. Steps which may go beyond this function are not within the scope of the payment system. They belong to the NCB/ECB or inter-NCB/ECB accounting.

2.5 ENSURING AVAILABILITY, SECURITY AND MINIMUM CAPACITY

It was defined in the Interlinking User Requirements that RTGS systems and Interlinking components have to provide a high level of reliability. In other words, they have to have high availability, be secure and have sufficient capacity has to meet the User Requirements.

It is an individual task of each NCB and the ECB to ensure adequate availability, security and capacity levels on systems and communication lines up to the point where the data have been taken over by S.W.I.F.T.'s access point.

2.5.1 Availability

In this respect, because of the decentralised design of the Interlinking and the inclusion of the S.W.I.F.T. network, two areas which have to meet the User Requirements can be clearly distinguished:

- **NCBs/ECB individual processing and communication up to S.W.I.F.T.'s access point**
- **S.W.I.F.T. network SAP (S.W.I.F.T. Access Point) to SAP**

It is S.W.I.F.T.'s task to ensure sufficient availability both of their network and of their OPCs. (S.W.I.F.T. Operating Centre)

2.5.2 Security

In the Interlinking context, the methods used to check integrity, authenticity, confidentiality and non-repudiation are provided by S.W.I.F.T. and have been evaluated. In addition, S.W.I.F.T. has well defined methods for network access and for access to the FIN application.

By contrast, the security implementation within domestic computer systems used by NCBs and the ECB depends on the chosen Computer Based Terminal (CBT). The development of software in this environment is an individual task of the participants in the Interlinking. S.W.I.F.T. provides only a description of the functions.

2.5.3 Minimum capacity

The NCB/ECB computer systems for TARGET/Interlinking purposes have to be chosen by the NCBs/ECB to allow a sufficient throughput. The telecommunication link to S.W.I.F.T.'s access point has to be adjusted to the volume of payments expected. S.W.I.F.T. must be informed with a sufficient lead time about current and future capacity needs in the network stemming from the link to a national RTGS system in order to balance the throughput of its systems.

2.6 RESPONSIBILITIES

2.6.1 Interlinking communication functions

Because of the store and forward logic of the S.W.I.F.T. FIN service, NCBs and the ECB will never communicate directly with each other on the network layer. S.W.I.F.T. is the 'intermediary' in the communication process. Only the authentication function in S.W.I.F.T. FIN directly interconnects NCBs and the ECB. The following responsibilities can be distinguished:

- NCBs and the ECB are responsible for their equipment (including the link to S.W.I.F.T.'s SAPs) and for the reliable use of tools for the exchange of messages with S.W.I.F.T. and the exchange of keys with other participants in the Interlinking.
- S.W.I.F.T. is responsible for the proper design and maintenance of the 'communication tools' and highly secure delivery of messages after having acknowledged the message to the sending NCB/ECB.

2.6.2 Interlinking business functions

These functions are described in the Interlinking Specifications. These functions are mainly:

- the logical structure of communications (e.g. request/acknowledgement structure);
- tasks that have to be fulfilled in a specific time-span (e.g. start of error detection procedures);
- data presentation requirements (e.g. definition of message types).

Because the application layer of TARGET is completely independent from the underlying network each NCB and the ECB is responsible for its individual systems.

2.7 CURRENT STAGE OF THE SPECIFICATION PROCESS AND OPEN ISSUES

The key business features of the system are agreed. They were the basis for the creation of a system specification which should allow the development of a well functioning Interlinking system.

However, some business design issues are still open (e.g. the settlement of net settlement systems).

Some technical design issues may have to be re-opened to make adjustments in the future, but this is normal in such projects.

The open issues underline that there is a need for careful organisation of change-management to keep the next steps of the project within the approved TARGET time schedule. Therefore a change management scheme was developed, which channels change requests and brings the decision-making process to the appropriate layer of responsibility.

3. THE BACKGROUND AND SCOPE OF THE SPECIFICATIONS

3.1 TARGET AND THE INTERLINKING

The main objective of the TARGET system will be to serve the single monetary policy in Stage Three. The other objective of the TARGET system will be to improve the soundness of EU payment systems in Stage Three. This implies a wider use of RTGS procedures which are the safest payment mechanism to process large-value payments. However, in accordance with the market principle enshrined in the EU Treaty, the use of TARGET will not be compulsory, except for payments directly related to the implementation of monetary policy. TARGET will also improve the efficiency of cross-border payments in Stage Three, as required by Article 109f(3) of the treaty on European Union.

In keeping with the Treaty, TARGET will be a decentralised system with only some common functions undertaken by the European Central Bank (ECB).

These statements from the 1995 TARGET report create guidelines and the framework for the Interlinking System. However, this leaves a lot of scope for the development of the system.

To have a secure basis for the detailed design, within the framework of the TARGET report, the NCBs and the EMI on behalf of the ECB elaborated common User Requirements for the Interlinking System. These User Requirements were agreed by the WGPS. They are the only reference document for the detailed specification of the system. The detailed specifications are composed of the Interlinking Specifications and the Interlinking Data Dictionary.

3.2 SCOPE OF THE INTERLINKING SPECIFICATION

This document sets out the procedures for the implementation of the Interlinking System. The purpose of this document is to describe a technical solution that fulfils the User Requirements.

The Interlinking Specifications take into account the different solutions that NCBs develop for their domestic RTGS-systems. Starting from this, the proposed solution is flexible enough to link all kinds of RTGS infrastructures.

The Interlinking Specifications deal mainly with the link between NCBs and between NCBs and the ECB. The provision of an adequate infrastructure for the domestic link between the RTGS systems, the ECB Payment Mechanism and the Interlinking functions is an individual task of each NCB and the EMI on behalf of the ECB.

The link between the NCBs and between the NCBs and the ECB is built on network interfaces. The network itself will be transparent. Attributes of the initial network are specified and examined in the '*Evaluation of the S.W.I.F.T. Network*'⁴.

⁴ This document was approved by the EMI Council during its meeting on 2nd July 1996.

3.3 INTERLINKING SPECIFICATIONS AND USER REQUIREMENTS

The User Requirements describe comprehensively the business functions of the system. The Interlinking Specifications refer to the User Requirements from a procedural point of view within existing infrastructures.

To clarify the links between the User Requirements and Interlinking Specifications, each procedural description starts with the relevant User Requirements. On one hand, this method makes clear that all User Requirements were taken into consideration, on the other hand this method presents the different Interlinking functions following the intraday logic of the business day.

3.4 INTERLINKING SPECIFICATIONS WITHIN EXISTING INFRASTRUCTURE

The Interlinking specifications are built on pre-defined RTGS-infrastructures within the NCBs, the ECB-payment-mechanism at the ECB and on the S.W.I.F.T. network service. The proposal takes into account that these components will be used but leaves it to the NCBs to define how they will be implemented.

In addition, the Interlinking Specifications describe what further infrastructure is needed to fulfil the User Requirements.

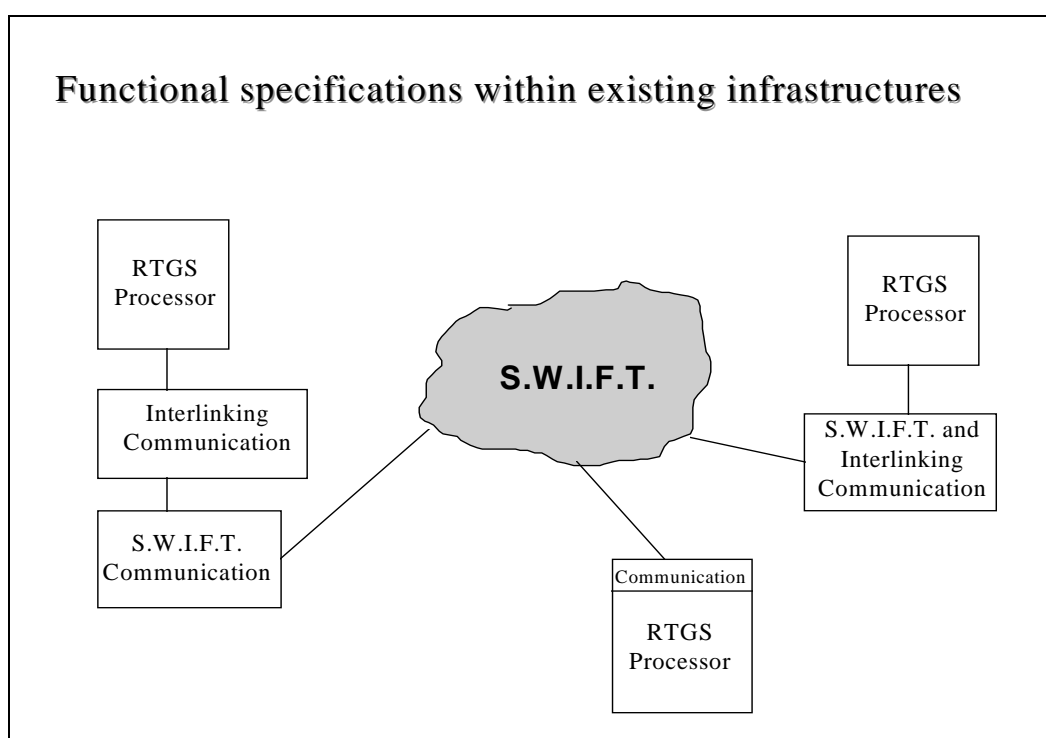


Figure 0-1 - Functional specifications within existing infrastructures

3.5 INTERLINKING SPECIFICATIONS, OPERATIONAL RULES AND USER HANDBOOK

The following specifications translate the requirements of payment systems experts into the more formal language of IT experts. In that way, the specifications clarify who has to provide what technical function and on what equipment. Because it is a main task of the paper to support the technical development of the system, the specifications do not deal with organisational matters.

4. DESIGN STRATEGY AND METHODOLOGY FOR THE SYSTEM

4.1 DESIGN STRATEGY

4.1.1 The User Requirement references

(UR.2.4) *It is an objective to design and implement the Interlinking System in time for the start of Stage III. As a minimum, sufficient functionality should be available by then.*

The design should make sure that adding new central banks and/or new facilities is possible in a structured way so that it does not necessarily complicate the design or introduce new programme risks. Therefore, the interface between the different systems involved should be well defined and follow agreed (international) standards as much as possible. At least, the following should be a guideline for the design:

- *message orientated exchange of payments (item by item);*
- *SWIFT formats as a basis for the data exchange inside the Interlinking.*

4.1.2 Structured design

The TARGET design takes into account the decentralised structure of the system. The logic of this approach is described in the following figure.

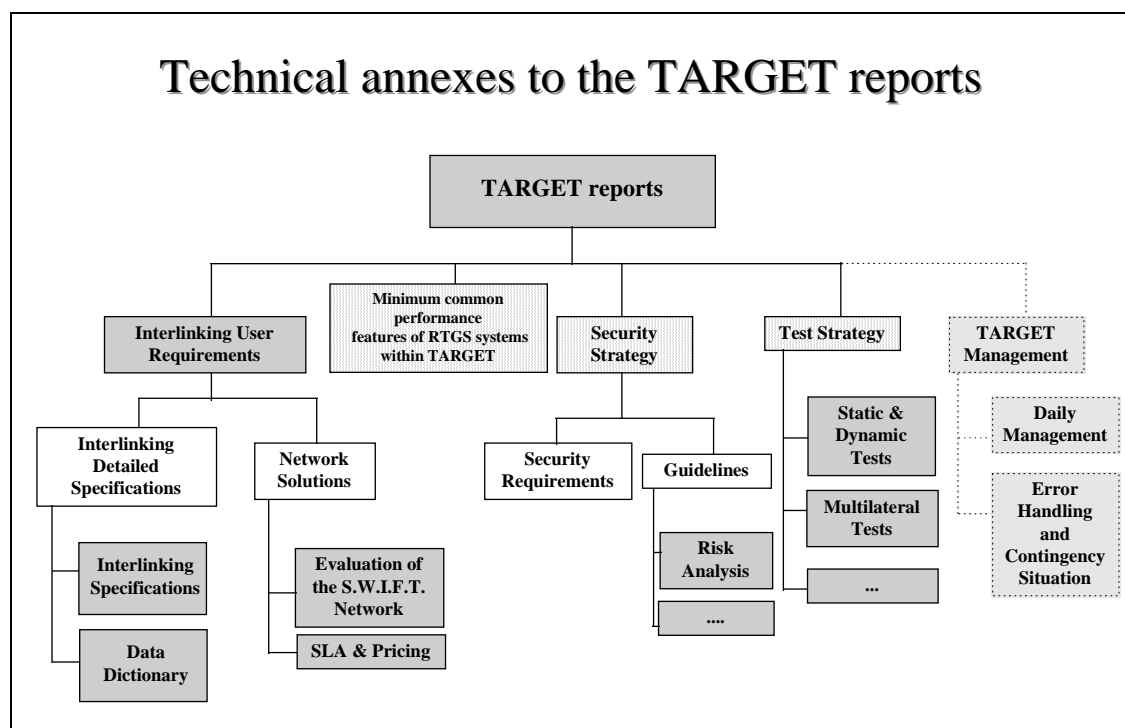


Figure 0-1 - Technical annexes to the TARGET report

Starting from the TARGET report, business requirements for the RTGS systems - Minimum common performance features of RTGS systems within TARGET - and for the common element - the Interlinking - are defined.

Beneath this level, a common technical design was made for the Interlinking. On the other hand, the 'Minimum common performance features for RTGS systems within TARGET', the security strategy and the test strategy make sure that the individual elements of the TARGET system - the RTGS systems - comply with a standard defined for TARGET as a whole.

This scheme allows a structured implementation of new features and a structured adding of new NCBs:

- Adding new features can start with the business design and can later on be further specified by following the described top down logic.
- Adding new NCBs is facilitated by the above design. They can easily recognise which common elements have to be provided and what is the individual freedom for the design and implementation of RTGS systems.
- In addition, it facilitates the classification of the various papers in the context of TARGET as a whole.

4.1.3 Building the system on decentralised individual RTGS systems and existing network infrastructure

For several reasons, it was decided that each country should build TARGET on individual RTGS systems, and that these systems should be linked along with the ECB payment mechanism via the existing S.W.I.F.T. infrastructure. Nevertheless, these decisions offer some leeway for the design of the Interlinking system. To support an open and flexible development of the system, a strategy for its design is needed.

To be open for a potential change of the network services, application-oriented functions (e.g. payment system functions) were clearly separated from network functions (e.g. data transmission, Message Authentication Code (MAC) calculation and MAC check on the communication layer). To be flexible for future developments, a logical communication structure was designed that facilitates the addition or change of functions (request/acknowledgement concept). Furthermore, the message policy supports a maximal independence from S.W.I.F.T. -formats but allows them to be used as a basis. The strategic guidelines for the Interlinking can be summarised as flexibility and independence.

The reference time for TARGET will be "European Central Bank (ECB) time." This avoids difficulties inherent in using either Central European Time (CET) or Greenwich Mean Time (GMT). CET has not been a stable concept over time and GMT would not take into account changes from summer to winter time, and vice-versa.

The adoption of ECB time, defined as the local time in the home city of the ECB, has the advantage of being easily identifiable and would automatically adapt to summer and winter time.

4.1.4 Flexibility and independence

4.1.4.1 Distinction between communication functions and business application functions

Distributed data processing, as required by the Interlinking, needs data storage, data processing and communication functions. Within this structure, communication functions

add, for several reasons (security, identification), information to the application data or even manipulate the data (e.g. encryption).

- Where these communication functions are integrated in the data processing for RTGS systems, a merging of functions will arise.
- If communication data and application data were to be integrated, an inappropriate and unmanageable merging of data would arise.

Consequently, to give the NCBs, and the EMI on behalf of the ECB, the opportunity for a clear functional design of their systems, a clear distinction between communication data and application data is made throughout the functional specification. This means, communication data are presented only in the header and the trailer of the message, and payment information is incorporated only in the text body of the message. Thus, all parties have a secure basis for the structured implementation of the system functions (see Figure 0-3).

4.1.4.2 Structured and secure communication

The User Requirements recommend that TARGET should be an efficient system, secure on one hand and providing a basis for a flexible development on the other.

Therefore, the Interlinking Specifications are based on a clear logical structure for communication. For example, in the Interlinking, messages are classified either as requests, notifications or as general purpose messages.

For request messages, a structure has been designed that defines the action or re-actions triggered by the request. For notifications that follow a request, a structure has been designed that tells the sender whether or not it was possible to comply with the request, and if so, what action was taken. A request is completed when the sender has received the appropriate matching notification. By definition, notifications never require an answer.

General purpose messages provide general information.

On one hand, this approach facilitates the definition of criteria for the completion of a communication, and on the other hand it is completely flexible as to the design of what was completed and what following action has to be taken.

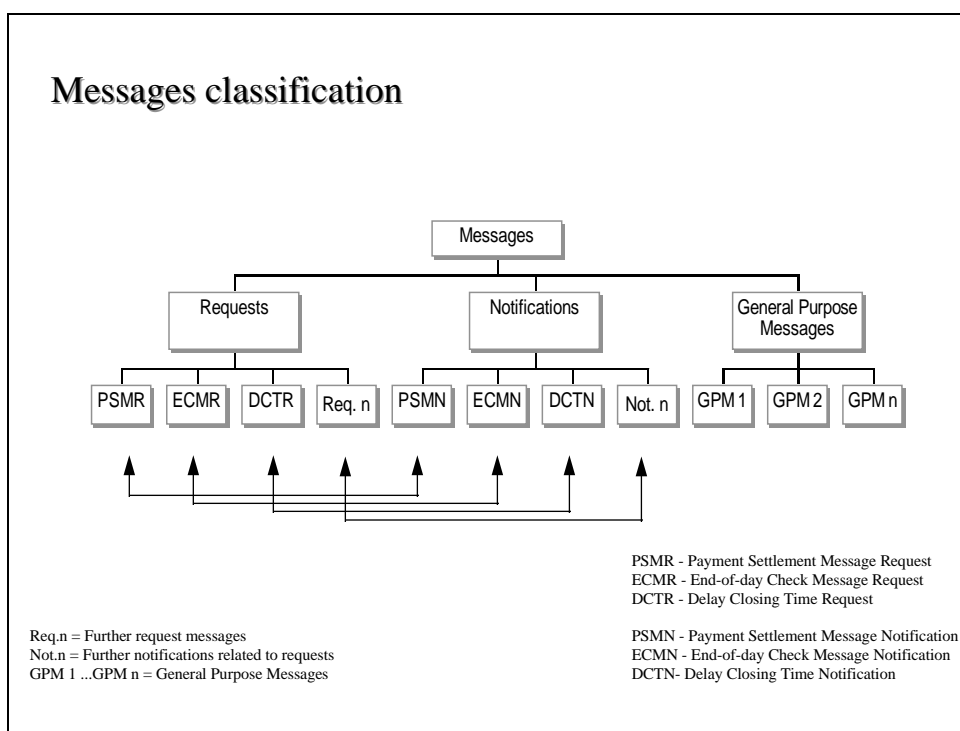


Figure 0-2 - Message classification

4.1.4.3 Message policy

The Interlinking message design will be based on the widely used S.W.I.F.T. message standards. To minimise the dependence on S.W.I.F.T. message definition and to avoid a merging between payment data (e.g., amount, beneficiary, etc.) and the protocol information of the communication, all messages are presented within an “envelope”: the S.W.I.F.T.-proprietary message (MT 198).

This approach gives the NCBs, and the EMI on behalf of the ECB, maximum flexibility to change or even to expand the Interlinking formats independently from S.W.I.F.T.. On the other hand, the NCBs and the ECB can adopt S.W.I.F.T. message standardisation processes where appropriate.

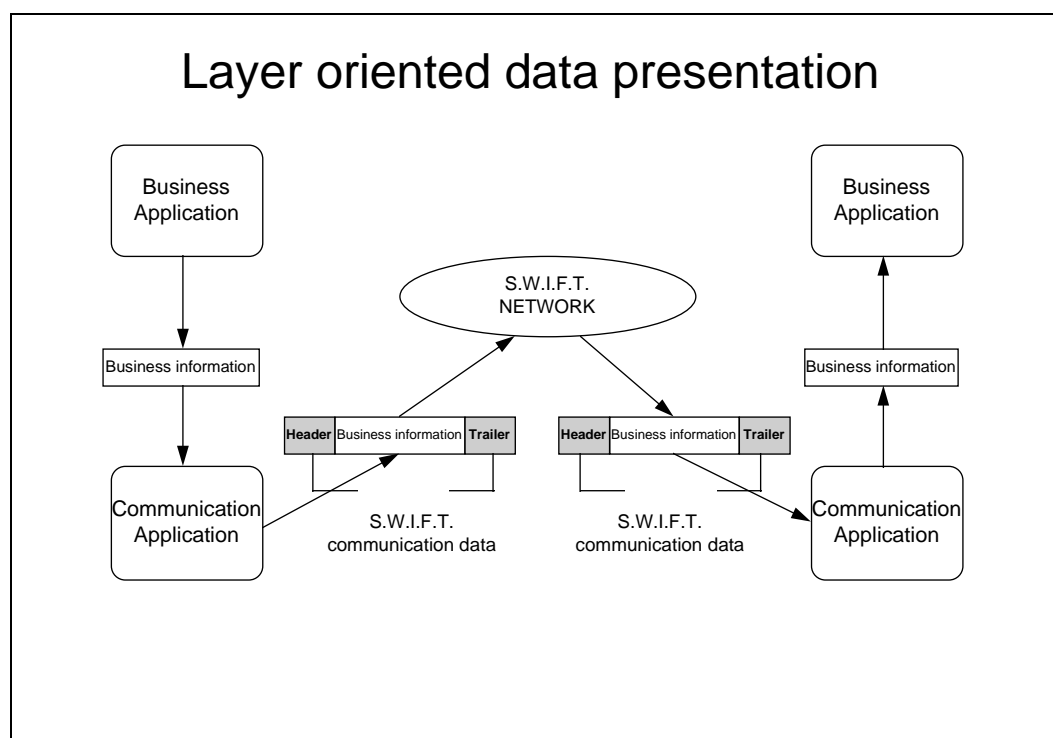


Figure 0-3 - Layer oriented data presentation

4.1.5 New functions within the existing infrastructure

Because they are not necessary for domestic RTGS systems, the Interlinking business functions as they are described in the User Requirements are completely new for NCBs/ECB. Neither S.W.I.F.T. nor any NCB provides these functions now. Nevertheless, the above mentioned design strategy allows use of the S.W.I.F.T. FIN service without any modification and, at the same time, a large degree of independence from the network provider.

4.2 METHODOLOGY FOR THE EXCHANGE OF INFORMATION

4.2.1 The User Requirement references

(UR. 3.5.3.) If domestic formats deviate from Interlinking standardised formats, the Interlinking component has to be able to handle full incoming standardised Interlinking payment messages and to convert them if necessary into a domestic data presentation. In the case that domestic formats deviate from Interlinking standardised formats (see 2.4), the domestic Interlinking component has to be able to convert outgoing full domestic data formats into the standardised data presentation used in the Interlinking.

National central banks or their operators will be expected to handle full incoming Interlinking messages like SWIFT MT 202 or MT 100.

The Interlinking component at each NCB has to be able to create and to transmit standardised messages for further services (handling of errors, end of day message checks, transmission of management information data etc.).⁵

4.2.2 Classification of messages

In the Interlinking System, three categories of messages will be implemented:

- The **Request Messages**. Messages used when a defined reaction from the receiving NCB/ECB is required. Typical messages of this type will be payment messages (which require an acknowledgement) and end-of-day messages to the ECB (which require a matching notification).
- The **Notification Messages**. Messages in this category are replies to requests. Notifications (or acknowledgements) can be either positive (ACK) or negative (NACK). A notification completes the communication cycle initiated by a request.
- The **General Purpose Messages (GPM)**. These are informative plain-text messages. GPMs can be either broadcast to many NCBs/ECB or sent to a unique destination. For example, the ECB can send a message to warn an NCB that it has not received End-of-day information at the required time. GPMs do not require a notification.

4.2.3 The use of a message framework

The Interlinking will initially use the following message framework:

The S.W.I.F.T. proprietary messages MT198. The MT198 messages are envelope messages which contain a free space that can be formatted by the users according to rules bilaterally agreed. S.W.I.F.T. applies no validation on the content of the envelope, except that the characters used must belong to the S.W.I.F.T. character set, and the length of each line must not exceed 78 characters.

Such a framework gives a high flexibility to the use of current data formats, the provision of confidentiality and the evolution of data formats.

For payment messages, the User Requirements mention that the Interlinking must use messages like MT100 and 202. Therefore, within the envelope:

1. A subset of these messages has been retained as the maximum common format for all NCBs and the ECB. As a minimum, all mandatory S.W.I.F.T. fields have been retained.
2. Bank identification must be established by using BIC codes. BIC codes have to be validated against the BIC file distributed on a quarterly basis by S.W.I.F.T.
3. Encryption of the data may be considered. If required, an algorithm could be used in each NCB system that would allow encryption of payment information and make them unreadable to the outside world (including S.W.I.F.T.).

⁵ *Interlinking message types could stay within the FIN message definition if the maximum size of a single message is less than or equal to 10000 characters (free formatted message).*

4. If S.W.I.F.T. amends the syntax for the fields used in the MT100 or 202, NCBs and the ECB are free to evaluate whether or not they must adapt the Interlinking messages format.
5. For those NCBs which base the routing of inter NCB transfers on BIC code, NCBs are free to create pseudo BIC codes and branches in order to identify “internal accounts” without activating them on the S.W.I.F.T. Network.

4.2.4 The Request messages

4.2.4.1 The Payment Settlement Message Request (PSMR)

This category of message involves the following payment messages:

- Customer Transfer
- General Financial Institution Transfer

By issuing one of these messages, the sending NCB/ECB is requesting the receiving NCB/ECB to process a payment.

Because different cut-off times will apply for customer and inter bank payments in TARGET, domestic systems must be able to differentiate them.

As a minimum, amounts up to 12 integer digits and 2 decimal digits will be accepted by all NCBs/the ECB.

4.2.4.2 The End-of-day Check Message Request (ECMR)

This is the message sent by an NCB to the ECB at the end-of-day. It is used to provide the ECB with information concerning the payment messages exchanged during the current business day with other NCBs and the ECB as well as information about the next three business dates and times. As with all request messages, a reply is expected from the receiver, in this case the ECB, the End-of-day Check Message Notification (ECMN).

Optionally, if the NCB is not in a position to submit an ECMR, the ECMR may be manually keyed in by the ECB in the End-of-Day application.

4.2.4.3 The Delay Closing Time Request (DCTR)

The third kind of request message is used when an NCB/the ECB, facing technical problems to complete its business day wants to postpone its official closing time. For this, a DCTR message is used. Each NCB/the ECB has the right to postpone the closing of the TARGET system by one hour maximum provided that the request is made before 17:45. After that time, the request has to be agreed by the ECB. In the same way, a notification from the receivers is required, the Delay Closing Time Notification (DCTN).

4.2.5 The Notifications

4.2.5.1 The Payment Settlement Message Notification (PSMN)

This notification is a response to a PSMR. The receiving NCB/ECB will notify the sending NCB of the completion of processing by issuing a Payment Settlement Message Notification (PSMN). The PSMN should reach the sending NCB/ECB within the required

time-span of 30 minutes after debiting has taken place. The result of the processing may be:

- positive if the receiving NCB/ECB has successfully credited the RTGS account of the credit institution. When the positive PSMN is received by the sending NCB/ECB, the responsibility for the payment is taken over by the receiving NCB/ECB;
- negative if the receiving NCB/ECB cannot process the request. In this case the sending NCB/ECB remains responsible for the payment.

The PSMN is fundamentally different from either the S.W.I.F.T. ACK or the S.W.I.F.T. Delivery Notification.

The S.W.I.F.T. ACK is an acknowledgement that S.W.I.F.T. has taken the responsibility to carry the message to its final destination. It implies that S.W.I.F.T. has processed all the necessary validation, i.e., TID, syntax, etc. It is also a proof that S.W.I.F.T. has safely stored the message.

The S.W.I.F.T. Delivery Notification is delivered to the sender of the message, if requested, and signifies the delivery of the message. This notification implies that the CBT of the receiver has safely stored the message.

A positive PSMN goes far beyond these S.W.I.F.T. messages. It is generated by the receiving RTGS/ ECB payment mechanism after having credited the participating credit institution in the receiving system.

A PSMN should always be returned to the sending NCB/ECB in the case of receipt of a message whose message sub-type is not supported or not recognisable.

4.2.5.2 The End-of-day Check Message Notification (ECMN)

The End-of-day Check Message Notification is used to notify NCBs about the result of the End-of-day control operations. It will contain the results of the matching procedures performed by the ECB. This message has to be received by the NCBs within 30 minutes of the ECMR having been sent.

The ECMN will contain information relating to:

- successfully matched data (in the case that only successfully matched data are reported, the receiving NCB can close);
- unsuccessfully matched data (in the case that some unsuccessfully matched data are reported, the involved NCBs have to stay open);
- the next three operating days and times for each country.

4.2.5.3 The Delay Closing Time Notification (DCTN)

This notification is the response to the Delay Closing Time Request (DCTR). If the receiver accepts the new closing time, he will confirm agreement by sending a positive DCTN. On the other hand, if it is not possible to fulfil the request to extend the operating hours or the request of an NCB exceeds one hour or the DCTR is syntactically incorrect, a negative DCTN, with the relevant error code, is sent. The DCTN should reach the sender within the required time-span of 30 minutes.

4.2.6 The General Purpose Messages (GPM)

These messages cover a wide range of use. For example:

- to request end-of-day information from an NCB which has failed to send it by the required time;
- to broadcast information on local operational problems, e.g., RTGS systems problems, or to inform other NCBs/ECB that the situation is back to normal.

These are free format messages, so it is possible to provide the information in plain text. The GPMs can either be printed or screened.

4.2.7 Message referencing

The most important information in a S.W.I.F.T. message, excluding the text itself, is the Message Input Reference (MIR), related to the sender, and the Message Output Reference (MOR), related to the receiver.

It is also important to be able to have a unique reference for any inquiries to S.W.I.F.T.. However, the Transaction Reference Number (TRN), mandatory in every message, cannot be guaranteed to be unique. Many messages may have been sent with the same reference because they concern the same operation. Conversely, MIR and MOR are a collection of (network and message related) elements that form a unique reference during transmission over the S.W.I.F.T. Network.

A message will contain both the MIR and the MOR. Under normal circumstances, if no monitoring facilities were activated when the sender issued the message, only the receiver of the message will know both references.

However, those two references have an important drawback: they don't allow consecutive numbering between two NCBs/ECB. The numbering is only consecutive against the S.W.I.F.T. Network. No easy gap detection is therefore possible during the day for messages received from a particular NCB/ECB.

That is the reason why the Interlinking will need its own reference. The Interlinking Internal Reference (IIR), which is a bilateral reference, gives a unique bilateral numbering system for the messages.

Interlinking Internal Reference (IIR)

The references described above will only be useful when requests are sent to S.W.I.F.T.

In the Interlinking, there is a need for consecutive sequential numbering on a bilateral basis: the Interlinking Internal Reference (IIR).

Each NCB will have a different formatted numbering sequence that has the following format:

A	Y	Y	M	M	D	D	C1	C1	C2	C2	N	N	N	N	N
---	---	---	---	---	---	---	----	----	----	----	---	---	---	---	---

where:

A is the application identifier (A, B, C or D)
YYMMDD is the sending date
C1C1 is the sending country

4. DESIGN STRATEGY AND METHODOLOGY FOR THE SYSTEM

C2C2 is the receiving country
NNNN is the sequence number of the message

Example: A950629BEGB02345 is the reference for the message number 2345 sent on 29 June 1995 by Belgium to UK with regard to a PSMR (A).

The sequence number of the message is reset to '0' every day and is independent for each application code and within each application code for each pair of country codes.

The advantages of such a numbering mechanism are:

- During the End-of-day Control Operations, all NCBs will report the highest number received during the day, as well the highest number sent during the day. These numbers will be used for the matching procedure.
- If the receiving NCB needs to request the re-sending of a specific message, or a range of messages, there will be no ambiguity concerning the reference identifier of the messages.
- In case of investigation between two NCBs, they will have a common standard structured reference. In case of differences observed during the matching procedure at the end of the day, the sending NCB/ECB should be capable to justify any gaps in the IIRs received by the receiving NCB/ECB which are caused by special action on the part of the sending NCB/ECB, e.g. a PSMR has been cancelled after the IIR has been generated, but before the message was sent.

Notes: 1) The ECB and the Deutsche Bundesbank share the same country code in their BIC code⁶, i.e. DE. Therefore, any time a country code is used in isolation of a BIC code, EU will be used for the ECB and DE for the Deutsche Bundesbank. This also applies for the EMI.

2) During the day, no gap detection in IIR is required. However, according to error handling procedures, the sending NCBs should be able to justify any unsent IIR.

4.2.8 The resending of messages

The above described message strategy defines a message life cycle by which a message request must always be closed by a notification message. However, in some situations, e.g. when a PSMR has been sent but never received, or the notification has never been received, specific actions need to be taken to close that cycle. Therefore, NCBs/ECB should be capable of sending a duplicate of any PSMR, PSMN, ECMR or ECMN. The content of this duplicate should be exactly the same as in the original message, including its IIR.

Because IIRs have to be unique, if an NCB/ECB receives a message with a duplicate IIR, this second message will be disregarded. Any duplicate message received should be stored by the receiving NCB/ECB for audit trail purposes.

⁶ ISO rejected the request to create a country code for Europe.

5. THE PHYSICAL AND LOGICAL INFRASTRUCTURE OF THE SYSTEM

5.1 TECHNICAL COMPONENTS AND INTERFACES

5.1.1 The User Requirement references

(UR, 2.3.) *The Interlinking System is composed of a set of processing functions at each NCB and the ECB⁷. From this, the Interlinking contains the following functions:*

- *payment system related functions;*
- *accounting system related functions;*
- *monitoring functions at the ECB;*
- *communication functions of the Interlinking components;*
- *functions of availability and security;*
- *interface functions to the domestic RTGS systems or in the case of the ECB its payment mechanism.*

The Interlinking will handle payments in the single common currency only, regardless of the currency that may be used in the domestic RTGS systems.⁸

5.1.2 Network topologies for domestic RTGS systems' components and Interlinking components

Since RTGS systems are implemented differently from country to country, the approach to the design of the Interlinking components tries to be as flexible as possible. In this chapter, several types of RTGS topologies that comply with the User Requirements are described, together with their interfaces with the new 'Interlinking Components' that would allow the settlement of cross-border payments.

According to the 'User Requirements', "The Interlinking System is composed of a set of processing functions at each NCB and ECB." These functions were identified as: payment system related functions, accounting system related functions, monitoring functions at the ECB, communication functions of the Interlinking components, availability and security functions, interface functions between domestic RTGS and the ECB payment mechanism.

To facilitate the description, the following components were defined.

5.1.2.1 RTGS Communication Component

The *RTGS Communication Component* (RCC) is the domestic RTGS interface with the processing components. It is composed of procedures which handle the communication

⁷ *Some or all functions may be provided by a third party. In this case, the NCB and/or the ECB is/are responsible for the compliance of the operator with the User Requirements according to this document.*

⁸ *As far as national denomination still will be used in the RTGS systems of the participating countries, these systems have to provide a conversion feature for further handling in the Interlinking.*

functions between domestic RTGS participants, and convey the cross-border payments orders for further treatment by the processing components.

5.1.2.2 Processing Components: RTGS Processing Component and Interlinking Processing Component

The cross-border payment order has to be processed in two different stages: domestically and by the Interlinking. That is why the processing features of the system are divided into two different parts: the *RTGS Processing Components* (RPC) and the *Interlinking Processing Component* (IPC). Each one is responsible for dealing with the cross-border payment order in its design. The IPC implements only the payment system related functions and the interface functions to the domestic RTGS systems, or the ECB payment mechanism.

5.1.2.3 Interlinking Communication Component

The *Interlinking Communication Component* (ICC) implements the communication functions between the Interlinking components and the Interlinking network. It is responsible for receiving, sending and routing of Interlinking messages. It has to transmit, receive and decrypt Interlinking messages. It also has the ability to handle any errors that might occur during the communication process between the participants in the Interlinking System.

5.1.3 The interfaces between components

The functional specification does not require a detailed description of how processing is organised prior to the Interlinking communication component. It is up to the NCBs and the ECB to organise these functions. Hence, the functional specifications will refer to a standard interface description which distinguishes between RTGS communication components, processing components (RTGS and Interlinking) and Interlinking communication components. This structure will be used in the whole functional specification for analysing and presenting data flow and describing the interaction between different functions.

These elements are described below, together with the interfaces established between them. For each one reference is made to the appropriate section of the User Requirements.

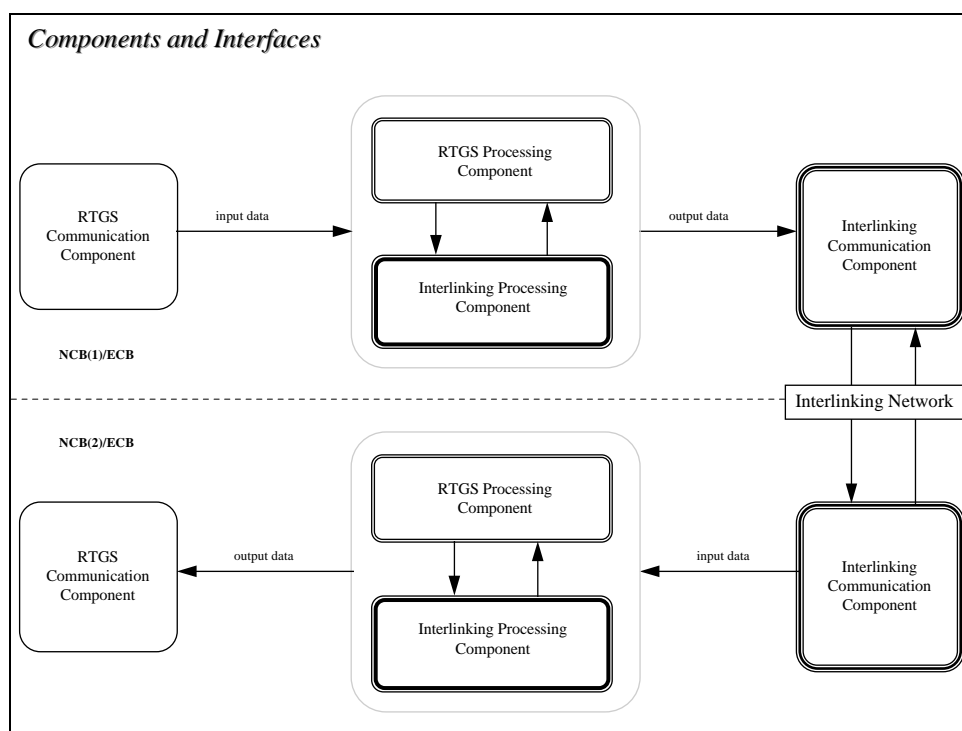


Figure 0-1 - Components and Interfaces

5.1.4 Topologies

5.1.4.1 V-shaped topology

Within a V-shaped system, a full domestic payment message is passed by the sending bank to the NCB. Once settlement is complete, the full message is passed by the NCB to the receiving bank.

Within a V-shaped routing, the NCB receives cross-border payment orders directly from its participants. After processing (syntax check, settlement etc.), the NCB submits the whole payment message to the Interlinking network. Incoming Interlinking messages will be processed and transmitted to the beneficiary credit institutions.

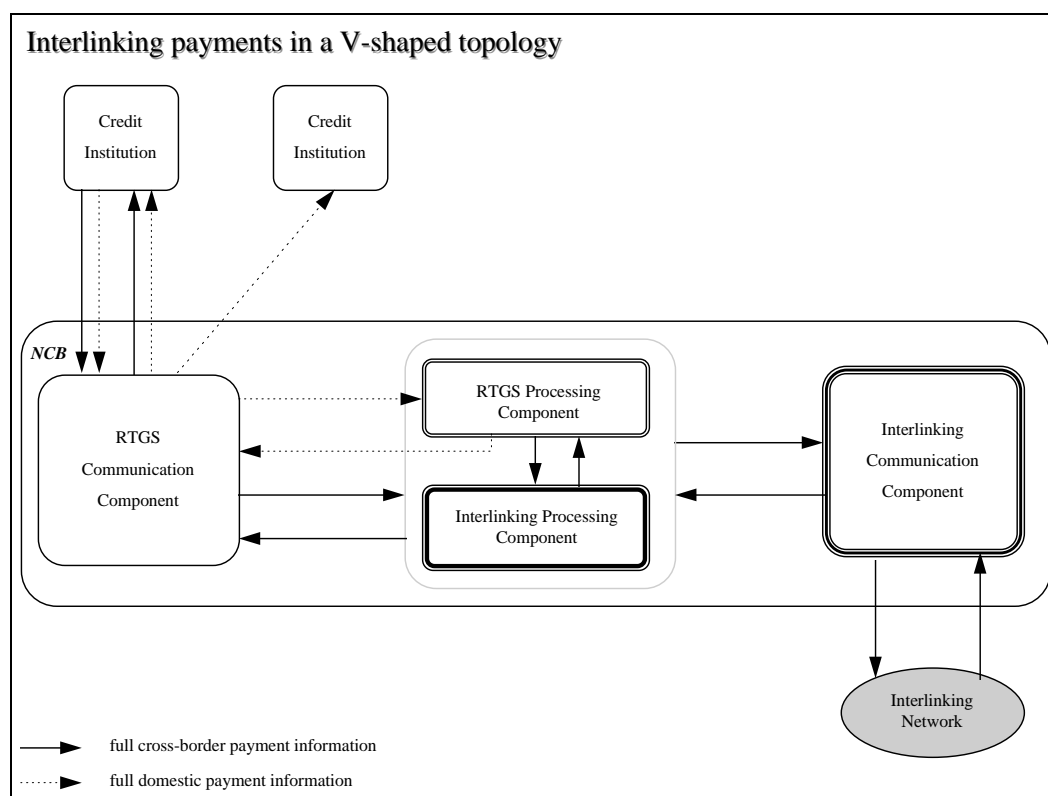


Figure 0-2 - Interlinking payments in a V-shaped topology

5.1.4.2 Y-shaped topology

With a Y-shaped system, domestic payment instructions are sent in the first instance from the sending bank to a data collection point. A settlement request (or a full payment message) is then passed from this collection point to the NCB for settlement. Once settlement is completed, the NCB sends a confirmation of settlement (or the full message) back to the collection point. The full payment message is then routed from the data collection point to the receiving bank.

Within a Y-shaped routing the NCB has, in principle, two alternatives for submitting cross-border payment data to the Interlinking network.

One possible Y-shaped approach would be to submit the full cross-border payment message via the data collection point to the Interlinking network after processing within the NCB (debiting of the account of the ordering credit institution, crediting of the account of the receiving NCB/ECB etc.) was completed and settlement confirmation was received by the data collection point. Full incoming Interlinking messages would be stripped at the data collection point. The RTGS-processor would process the settlement request. The beneficiary bank would receive the full cross-border payment message.

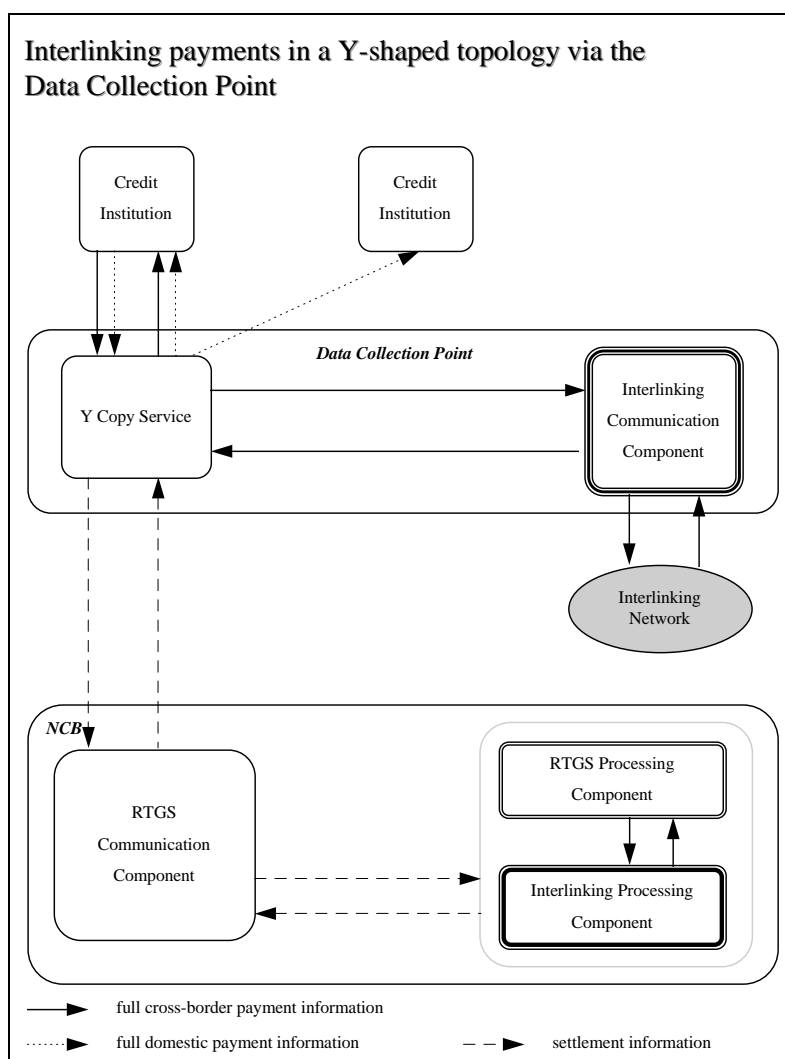


Figure 0-3 - Interlinking payments in a Y-shaped topology via the data collection point

An alternative might be that the data collection point would send, in the case of a cross-border payment, the complete payment order to the NCB for further processing and the NCB would submit (after having completed processing as in the case of a V-shaped structure) the whole payment to the Interlinking network⁹. Full incoming Interlinking payments would be received by the NCB and processed as in the case of a V-shaped topology. The communication to the beneficiary bank would take place via the data collection point.

⁹ In a T-shaped routing, the sending bank passes a full payment message to the receiving bank but at the same time a duplicate is produced and sent to the NCB. The NCB settles the payment on the basis of the information contained in the duplicate message independently of the main message. Because the only participants in the Interlinking are the NCBs and the ECB and the Interlinking conveys only irrevocably and finally settled funds, a T-shape system can be seen, for cross-border payments purposes, as a Y-shaped system.

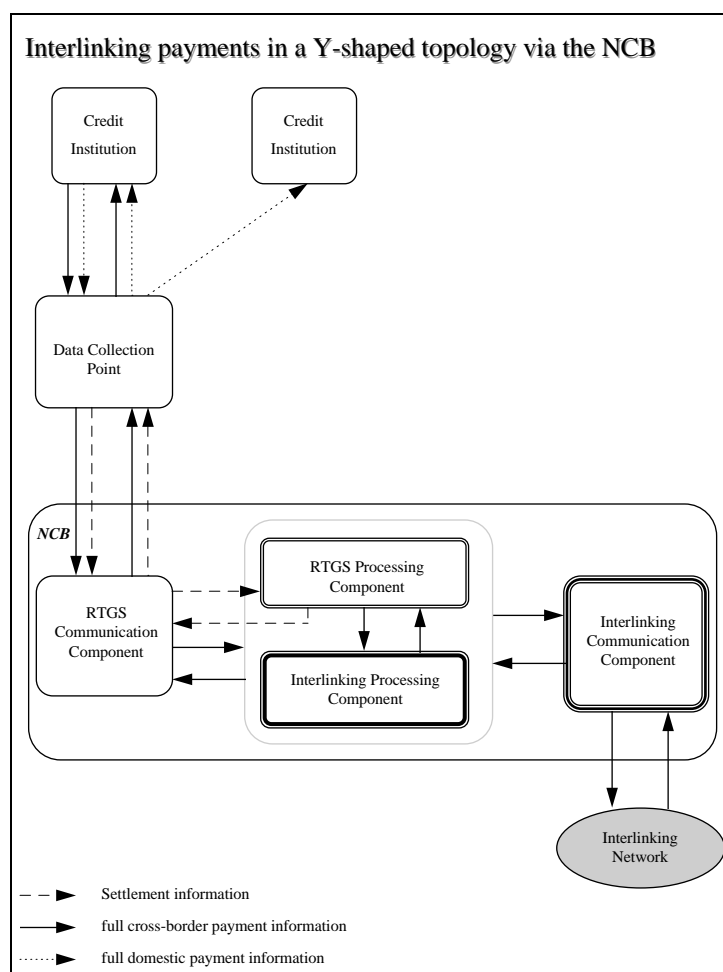


Figure 0-4 - Interlinking payments in a Y-shaped topology via the NCB

5.1.4.3 L-shape topology

Under the L-shaped confirmation system, each domestic payment instruction will be settled at the NCB before it is sent to the receiving bank. In this routing, for each payment instruction the ordering credit institution sends to the NCB a settlement request, while the main message is retained in the sending bank's system. Only if the sending bank has sufficient funds on its RTGS account will the NCB settle the transaction, by debiting the account and crediting the receiving bank. The posting to each account will take place simultaneously. The NCB will then return a confirmation to the sending bank. As soon as this is received, the main message, containing the full payment details, will be automatically released to the receiving bank. The receiving bank will then know that it has received final and irrevocable funds on its account at the NCB.

Because only NCBs and the ECB participate in the Interlinking, the sending credit institution has to transmit the full payment details of a cross-border payment to the NCB. After having successfully processed the payment order (syntax check, settlement etc.), the NCB or its operator will submit the full payment instruction to the Interlinking network. Full incoming Interlinking messages as well will be processed in the NCB and transmitted to the receiving credit institution by the NCB or its agent.

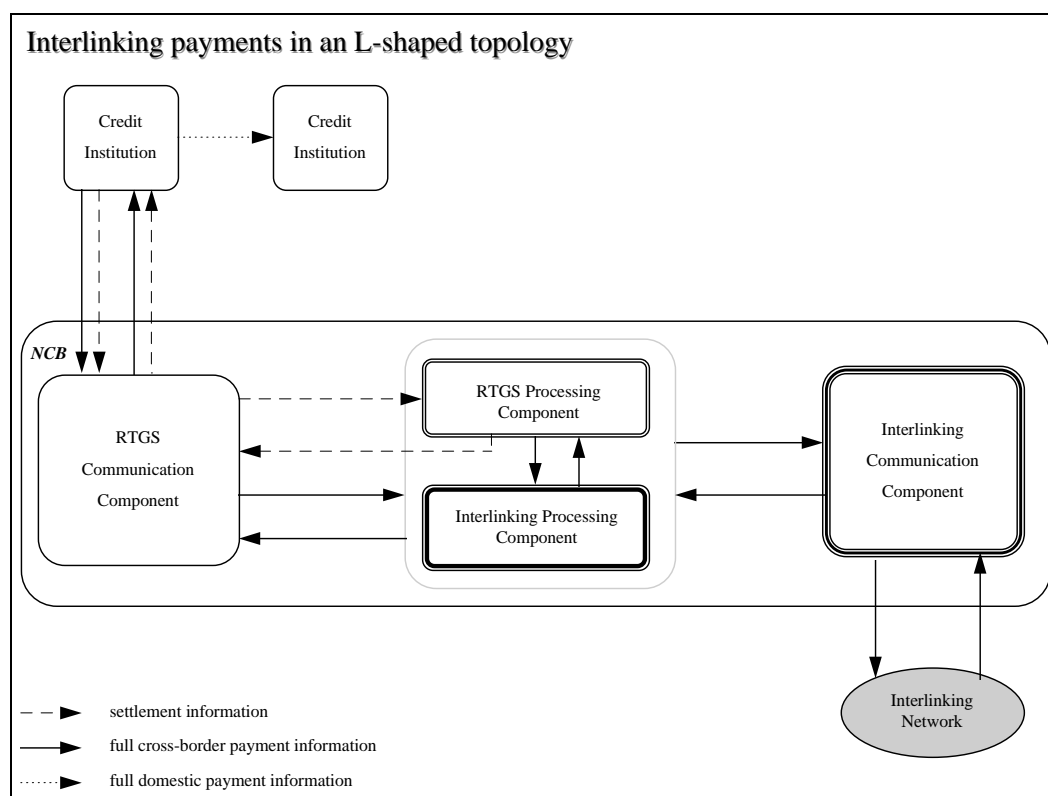


Figure 0-5 - Interlinking payments in an L-shaped topology

5.1.5 The link between different topologies and their interfaces

5.1.5.1 The link between different topologies

Only NCBs and the ECB are directly connected to the Interlinking network, but some or all Interlinking functions may be provided by a third party. In this case, the NCB and/or the ECB is/are responsible for the compliance of the agent with the specifications of the Interlinking System.

Hence, technically the Interlinking is the link between IT-systems at the NCBs and the ECB or any agents who work on behalf of the NCB/ECB. The link takes place via Interlinking communication components which have to provide defined functions.

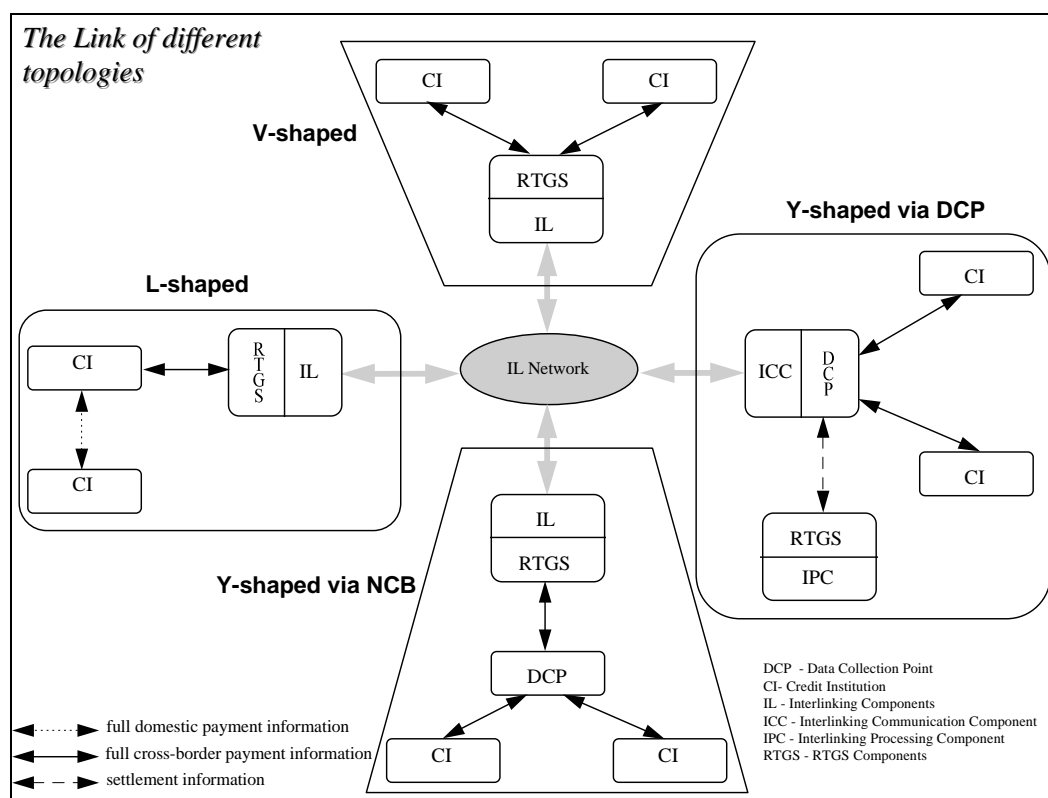


Figure 0-6 - The link of different topologies

5.1.6 Standard and Contingency features of the Processing and communication components

5.1.6.1 The User Requirement references

(UR. 3.6.2.) *In addition to the processing and transmission time that was already described, the different systems involved have to fulfil the following criteria:*

In the case of a distortion of the network (including the sending and receiving systems in the NCBs and the ECB) recovery measures have to make sure that a contingency link with an adequate capacity is available within four hours.

In addition, TARGET as a whole has to provide facilities capable of completing the business day in a final and irrevocable position before the start of the next one (before the opening time of domestic RTGS systems on the next business day), and to provide a sufficient infrastructure to conduct the next business day¹⁰.

5.1.6.2 Structure of the required components

Availability of the Interlinking refers to the availability of TARGET as a whole. Hence, this paragraph outlines a structure that includes domestic RTGS-processing components as a whole.

¹⁰ *Because the NCBs and the EMI on behalf of the ECB are free to implement Interlinking application functions within domestic RTGS systems or in a separate module, the Interlinking User Requirements do not provide a definition of availability criteria for domestic Interlinking components. This is more than an Interlinking requirement. The implication of this need will have to be investigated carefully for the RTGS systems and for TARGET as a whole.*

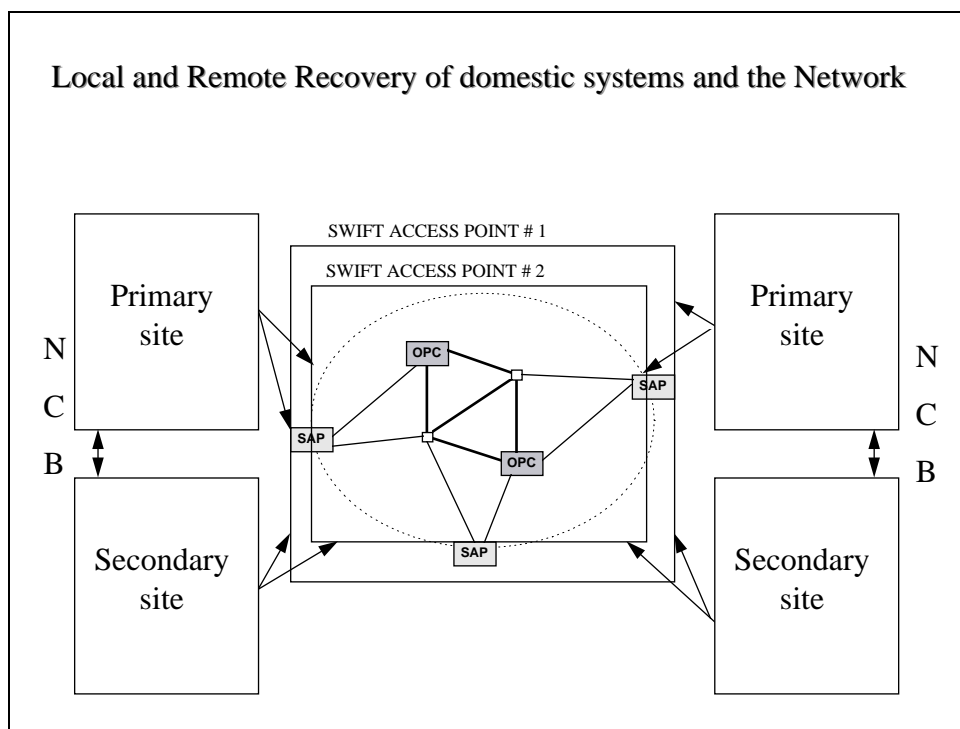


Figure 0-7 - Local and Remote Recovery of domestic systems and the Network (example)

It is a requirement to provide a fully redundant network and processing components to support a large-value payment system capable of completing the business day, in a final and irrevocable position, before the start of the next one and to provide a sufficient infrastructure to conduct the next business day.

It is S.W.I.F.T.'s task to provide a fully redundant network behind the S.W.I.F.T. Access Points (SAPs) and to fulfil the User Requirements described in the preceding section. The features of the S.W.I.F.T. Network are set out in 'Evaluation of the S.W.I.F.T. Network'.

5.1.7 Confidentiality, Integrity, Authentication and non-repudiation - interface of the components

5.1.7.1 The User Requirement references

(UR 3.7.2.) *The methods applied for the communication between Interlinking components will have to provide features against threat to integrity, authentication and non repudiation. These methods have to be designed so as not to be compromised and not to be compromisable in the foreseeable future. They have to be implemented and monitored in a way that makes sure that they will be used in a proper way.*

(UR 3.7.3.) *Payment data that are communicated between Interlinking components at different NCBs/ the ECB payment mechanism have to meet an appropriate level of protection against the loss of confidentiality. These methods have to be designed so as not to be compromised and not to be compromisable in the foreseeable future. They have to be implemented and monitored in a way that makes sure that they will be used in a proper way.*

5.1.7.2 Structure of the required components

5.1.7.2.1 Encryption

The User Requirements allow two different technical solutions to provide confidentiality:

- Line encryption during communication between different systems and plain text on processing systems.
- End-to-end encryption of business data between NCBs/ECB and partial plain text for the routing of data via the network.

The Interlinking will initially use S.W.I.F.T. FIN standard encryption features. Later on a move to end-to-end encryption is envisaged.

5.1.7.2.2 Authentication

The equipment for authentication and non-repudiation on the communication level is provided by the CBTs. It is implemented via the S.W.I.F.T. card reader and the S.W.I.F.T. CBT. The features of these components are set out in 'Evaluation of the S.W.I.F.T. Network'.

Because authentication components have to be available under all circumstances, their provision should be fully redundant on the domestic level. If the CBT provides sufficient space to store more than one authentication key, only the messages authenticated with the current key will be considered as successfully authenticated.

5.1.7.2.3 Integrity

Data integrity is assured by S.W.I.F.T. FIN standard features.

5.1.7.2.4 Non-repudiation

Because S.W.I.F.T. can be seen as a trusted third party in the store and forward communication process, non-repudiation is available via S.W.I.F.T.'s long term storage of data.

5.1.8 Performance features of the components and the interfaces

5.1.8.1 The User Requirement references

(UR 3.5.5.) The standard time for the 'travel' through the Interlinking System (transmission between Interlinking communication components) will be estimated to be under ten seconds for 99 per cent of transactions per day and less than 15 minutes for the remaining transactions (under normal situations).^{11 12}

¹¹ The figures in this paragraph should be seen as objectives. Since a service provider is chosen, such timing may have an effects on costs. Hence, the trade off between speed and costs will be investigated carefully and this provisions may have to be revised accordingly.

¹² The processing and transmission time from one RIGS system to another RIGS system (which is not an Interlinking requirement) were also defined by the Interlinking Task Force. It was proposed as the sum of the time required in the sending and the receiving RIGS system including the communication between the RIGS system and the domestic Interlinking component (each time 7.5 minutes) plus Interlinking time as defined above, i.e. a total time of max. 30 minutes

5. THE PHYSICAL AND LOGICAL INFRASTRUCTURE OF THE SYSTEM

(UR 3.5.6.) The performance of the Interlinking components including the interface between the domestic Interlinking component and the RTGS system/ECB payment mechanism has to be sufficient, to support the processing time mentioned above.

The design of the performance depends mainly on the number of payments that will have to be processed. The data flow will have to be investigated carefully, to provide figures for the design of the system.

(UR 3.8.) The NCBs and the ECB has to provide adequate interfaces to the domestic RTGS system or the ECB system to achieve a sufficient fast and secure communication between these components following the requirement stated in this chapter¹³.

5.1.8.2 Performance of the network

The communication network for the link between NCBs, and between NCBs and the ECB, is divided into two parts:

- The link between the NCB/ECB CBT and the SAP
- The internal link between different SAPs

S.W.I.F.T. will have to provide adequate capacity for the link between SAPs (which includes all components within the network). These are investigated in 'Evaluation of the S.W.I.F.T. Network'. The NCBs, and the EMI on behalf of the ECB, have to assess individually their needs and have to provide individually an adequate performance level for the link between their CBT and SAP (together with S.W.I.F.T.).

5.1.8.3 Performance of the domestic components

The NCBs, and the EMI on behalf of the ECB, will design and implement the relative systems ensuring there is adequate capacity for all systems linked to the CBT.

5.2 ACCOUNTING FRAMEWORK FOR THE INTERLINKING

5.2.1 The User Requirement references

(UR 3.3.) To meet the technical needs for the daily processing of payments, each participating NCB will open one account for each NCB and the ECB. The ECB will open accounts for all NCBs.

5.2.2 Accounting functions related to the Interlinking

Two accounting functions are to be provided in TARGET:

- Irrevocable and final debiting and crediting of payments (RTGS function);
- Record keeping on inter-NCB/ECB accounts (Interlinking function).

(this definition covers the delay from the debiting of the account of the ordering bank by the sending RTGS system until the crediting of the account of the beneficiary bank at the receiving NCB).

¹³ *This solution gives maximum independence to the NCBs and to the EMI on behalf of the ECB. However, a higher level of harmonisation might be required for TARGET as a whole.*

5. THE PHYSICAL AND LOGICAL INFRASTRUCTURE OF THE SYSTEM

Irrevocable and final debiting or crediting will take place on the accounts within a domestic RTGS-system, or the ECB payment mechanism. In addition, there may be some further payments stemming from trading activities of the NCBs and the ECB on their own behalf, when a Credit Institution is involved. These transactions should also be mirrored in the inter-NCB accounts.

5.2.3 The provision of intraday liquidity¹⁴

In principle, the technical and functioning rules will be identical for RTGS systems of euro countries participating in TARGET, or RTGS systems of non-euro countries connected¹⁵ to it.

The ECB Governing Council will decide whether intraday credit may be granted by the ESCB to NCBs of countries not yet participating in the Monetary Union. Following a decision made by the EMI Council in December 1996, three mechanisms are being prepared which aim at preventing intraday credit, if granted to non-euro area NCBs, from spilling over into overnight credit. A final decision on which mechanism(s) to implement will be taken by the Governing Council of the ECB.

The mechanisms are:

- mechanism 1: high penalty rates on spillovers (supplemented by non-pecuniary sanctions) and early cut-off time for customer payments, in euro and non-euro countries;¹⁶
- mechanism 2: limits (possibly set at zero) for intraday credit granted by euro NCBs to non-euro NCBs, with control by each non-euro NCB of its consolidated exposure to the euro area;
- mechanism 3: earlier cut-off time for non-euro TARGET participants (NCBs and credit institutions).

For mechanism 3, the EMI Council agreed that the earlier cut-off time will not apply to the processing of payments by the non-euro NCBs, but rather to the use of intraday credit in euro by them. This implies that the cut-off time for processing payments will be the same for euro and non-euro participants but that, from a certain time on, non-euro NCBs would be allowed to issue further payment instructions to euro NCBs only if they have a positive balance in euro vis-à-vis the euro zone as a whole. The time at which this deadline is to be set will be decided by the ECB, if the ECB Governing Council decides to implement this mechanism.

This way of implementing mechanism 3 would be advantageous for both euro and non-euro participants: euro participants would not have to consider separate timetables for sending payments to non-euro participants and the latter would be able to process payments until 6 p.m., provided that sufficient funds are available. Moreover, this mechanism would facilitate the distribution of liquidity in euro between participants in TARGET, by avoiding funds remaining unused in accounts located in non-euro countries. This proposal would not have any negative impact on the conduct of monetary policy; on the contrary, it could contribute to the smooth functioning of the money market in euro.

¹⁴ This section is copied from the 'Second Progress Report on the TARGET Project'.

¹⁵ These common rules concern the RTGS systems of non-euro countries only when they process euro payments.

¹⁶ The early cut-off time for customer payments applies in all three mechanisms.

6. THE BUSINESS FUNCTIONS OF THE SYSTEM

6.1 CROSS-BORDER SINGLE PAYMENT TRANSFER

6.1.1 The User Requirement references

(UR 3.2.1.) *The payment data transmitted across the Interlinking System will represent payments, expressed in the single common currency, that have been finally and irrevocably debited from the account of the bank of the originator in the originating national RTGS system.*

(UR 3.2.3.) *Each payment, passing through the Interlinking must have an unique identifier to facilitate message identification and error handling.*

(UR 3.2.4.) *The sending NCB/ECB has to check the syntax of the data according to the appropriate standard, the value date of the payment order (the check that it is same day¹⁷) and the availability of the receiving NCB/ECB (predefined criteria; e.g. holiday). If syntax errors or other reasons for a rejection are detected, the sending NCB/ECB handles the data according to domestic rules¹⁸.*

The receiving NCB/ECB has to check all parts that are necessary for successfully crediting the account of the beneficiary bank in line with its own national provisions (including the unique identifier to avoid double crediting).

(UR 3.2.5.) *By means of a negative acknowledgement, the receiving NCB/ECB will immediately inform the sending NCB/ECB about the impossibility of crediting the beneficiary thereby stating the reason for non executing the payment. The reasons can be:*

- *the impossibility to identify the receiving institution;*
- *other problems stemming from the content of the message;*
- *unavailability of the receiving system.*

The sending NCB/ECB handles the data according to domestic rules¹¹.

(UR 3.5.4.) *The receiving NCB/ECB has to send an automatically generated acknowledgement to the sending NCB/ECB for each payment message received.*

If the crediting of the beneficiary bank in the RTGS system is successfully completed, the acknowledgement will be positive. In the case that an error occurs during the processing and the processing cannot be completed, a negative acknowledgement will be sent to the sending NCB/ECB stating the reason for the negative acknowledgement.

Responsibility for the payment is only passed over to the receiving NCB/ECB following the reception of a positive acknowledgement from the receiving NCB/ECB. For the sender, a positive acknowledgement is the proof of the receipt and successful crediting of the beneficiary bank's account in the receiving NCB/ECB.

¹⁷ *The value date is a feature of some domestic RTGS systems. The only value date of the Interlinking System is 'today'.*

¹⁸ *The sending NCB decides, for example, to re-credit the account of the originator and re-routes the data or to credit an offset account for correcting the payment data and repeat the transmission via the Interlinking.*

If an acknowledgement has not arrived within 30 minutes¹⁹ after the debiting has taken place, the sending NCB has to start with error detecting procedures.

6.1.2 The functions of the cross-border single payment transfer

These functions are set out comprehensively in the User Requirements.

6.1.3 Settlement message flow

6.1.3.1 Payments between Credit Institutions

The flow of messages relating to the settlement of a cross-border payment can be seen from the following diagram. Each 'box' represents those components that were identified and described in 5.1.

The figure represents one of the many possible ways of implementing of this procedure. Several scenarios are feasible, depending on how each component will be implemented.

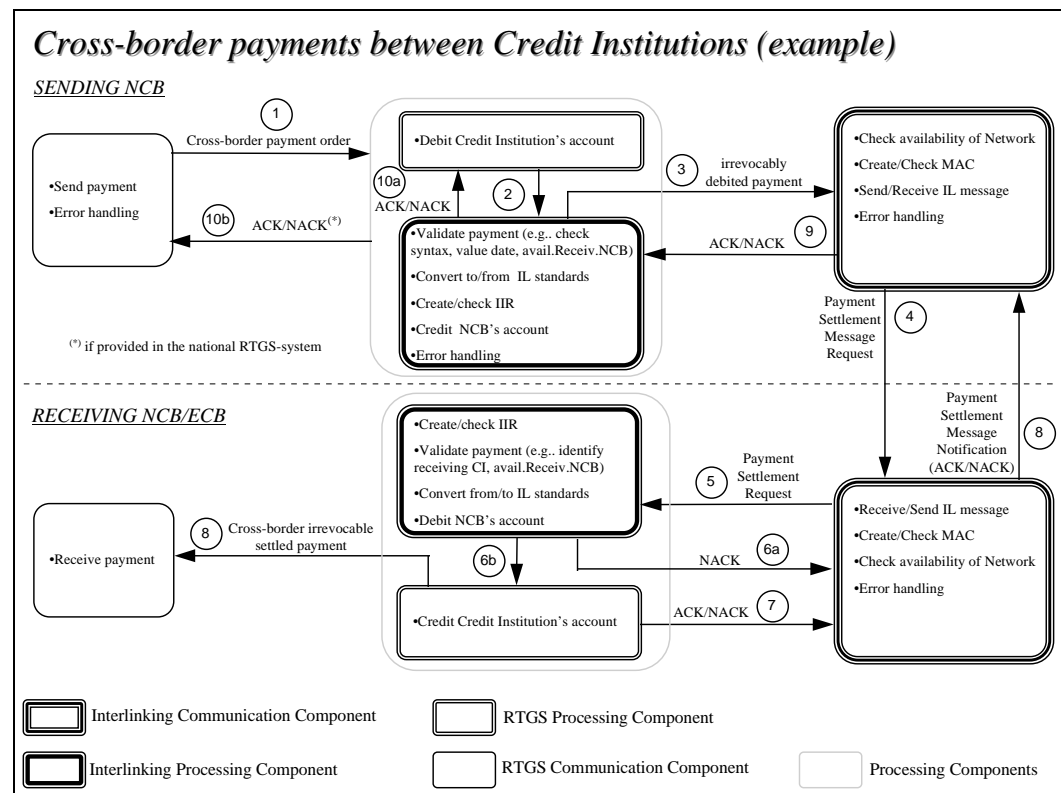


Figure 0-1 - Cross-border payment between Credit Institutions

On the Sender's side

One Credit Institution issues the cross-border payment via the RTGS-system, or the NCB/ECB makes a payment from an internal account. The RTGS Communication Component (RCC) conveys the cross-border payment order to the Processing Components.

¹⁹ 30 minutes should be considered as a maximum time that could be lowered, according to experience.

The payment order is processed by the RTGS Processing Component and by the Interlinking Processing Component (IPC). The payment is validated (e.g. availability of the receiving NCB/ECB), the amount is debited²⁰ from the sending Credit Institution's account, and the receiving NCB's/ECB account is credited. At this stage the cross-border payment is considered as being irrevocably debited. The IIR (Interlinking Internal Reference) is created and the domestic message is converted to an Interlinking standard message. The payment is then routed to the Interlinking Communication Component (ICC). The sequence of events and the components responsible for these procedures may differ from NCB to NCB.

The next step is to issue the cross-border payment order to the Interlinking Network, via the Interlinking Communication Component (ICC). This component has to check the availability of the network, create the MAC (Message Authentication Code, which identifies and authenticates each message in the system) and send the *Payment Settlement Message Request* (PSMR) to the addressee NCB/ECB.

On the Receiver's side

The Interlinking Communication Component (ICC) receives the *Payment Settlement Message Request* (PSMR). After checking the MAC against the current authentication keys, it sends it to the Processing Component.

The cross-border settlement order is then processed by the Interlinking Processing Component (IPC) and by the RTGS Processing Component (RPC). The message is converted into a domestic format, data are validated (e.g., the IIR is unique, the receiving Credit Institution exists), the sending NCB's/ECB account is debited, and the beneficiary's Credit Institution's account credited. If this procedure is successful, the Processing Component sends a positive *Payment Settlement Message Notification* to the sending NCB/ECB via its Interlinking Communication Component (ICC), and communicates the settlement to the Credit Institution in its RTGS system. If not, a negative *Payment Settlement Message Notification* is sent to the sending NCB/ECB. The sequence of events and the components responsible for these procedures may differ from NCB to NCB.

On the Sender's side

When the sending NCB receives an acknowledgement for a PSMR that was sent previously, depending on domestic practices, a debit/credit advice may be sent to the ordering credit institution²¹.

6.1.3.2 Payments between the NCBs/ECB and credit institutions

For the Interlinking System, only one difference exists between cross-border payments between Credit Institutions and payments between NCBs/ECB and Credit Institutions. The difference is that in the latter case there will only be a movement in a Credit Institution's account at either the receiving or the sending NCB/ECB, but not at both. The PSMR indicates that either the ordering party or the beneficiary party of the payment is a Credit Institution and the other party involved is an NCB/ECB. Therefore the previous information flow between components applies for all cases (figure 6-1). Depending on the

²⁰ In some RTGS systems, the debiting of an account takes place only after a positive acknowledgement is received. In that case, funds will be blocked on the account of the ordering credit institution.

²¹ If the funds were blocked on the ordering credit institution and a positive acknowledgement is received, then the sending NCB must process the final debiting of the account.

architecture of the payment system applications at the NCBs/ECB, the “internal” accounts of the NCB/ECB will be held either directly in the RTGS-system or in another application. Nevertheless, the application connected to the Interlinking (RTGS or “internal” application) has to comply with the features required by this specification.

6.1.3.3 Payments between the NCBs/ECB

Payments among NCBs/ECB follow the same structure and message flow as described for payments between NCBs/ECB and credit institutions. The only difference is that both end-points of the transaction are either at an account belonging to an NCB or the ECB. For inter-NCB-transfers as in the case of all other interbank payments, the Interlinking MT 202 will be used. The non-TARGET BIC code of the receiving NCB will be put into the field 58A (beneficiary institution) of the MT 202. For the internal routing of the messages in NCBs/ECB a specific identifier “INTERNCB” (between slashes (/)) will be put in field 72 of the Interlinking message. In order to differentiate categories of payments, this identifier will be followed by a code-word. These code-words need to be defined by accounting experts.

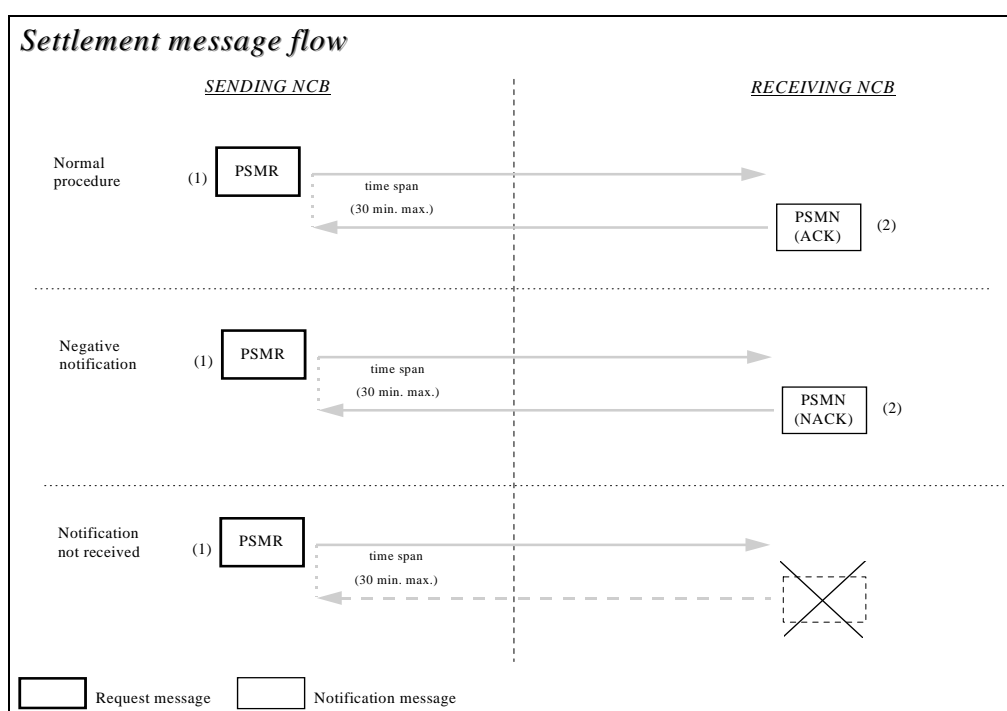


Figure 0-2 - Settlement message flow

6.1.3.4 Normal procedure

Payment Settlement Message Requests (PSMR) are used to transport cross-border payments.

The payment will remain the responsibility of the sending NCB/ECB until it has received the receiving NCB's/ECB's acknowledgement.

6.1.3.5 Negative notification

If some error occurs during processing (validation, crediting) of the payment settlement message, the receiving NCB/ECB issues a negative PSMN containing the reason for

rejection. This message ensures that the responsibility for the payment remains with the sending NCB/ECB. The sending NCB/ECB may decide, depending on the type of error, to reverse the payment or format a new payment message²².

A PSMN is also returned to the sending NCB/ECB in the case of receipt of a message whose message sub-type is not recognised.

6.1.3.6 Notification not received

If the PSMN message is not received within 30 minutes, the sending NCB/ECB has to initiate error detection procedures²³. If the PSMN was sent but never received, the receiving NCB/ECB has to be able to resend a duplicate of the PSMN at the request of the sending NCB/ECB.

Under some specific circumstances (e.g. disaster situation), an NCB/ECB may no longer be in a position to resend duplicates of a PSMN before the start of the next business day. Therefore, in order to allow the sending NCB/ECB to close the cycle of a pending PSMR, the latter should have the means to simulate the reception of a PSMN on its system. This procedure has to be formally agreed by both parties and should be conducted by the most adequate means (preferably an authenticated message).

6.1.4 Message types

6.1.4.1 MT198 sub 100 - Customer Transfer

6.1.4.1.1 Scope

This message is sent through the Interlinking by an NCB/ECB on its own behalf or at the request of a credit institution, to another NCB/ECB either for its own account or in favour of a credit institution.

It is used to convey a fund-transfer instruction in which the ordering customer or the final beneficiary, or both, are non-financial institutions.

The following guidelines apply when sending an MT198/100:

- The sending NCB/ECB should ensure that the original ordering institution is mentioned in field 52A (or the domestic equivalent). If this information is not provided by the sending institution and the sending NCB is not able to provide the information, the payment must be rejected by the sending NCB/ECB.
- The sending NCB/ECB should ensure that the bank of the beneficiary is mentioned in field 57A, and the beneficiary's account number is present in field 59. If either one of these items of information is not available, the payment should be rejected by the sending NCB/ECB.
- If field 56A is filled in, and the receiving NCB/ECB is able to identify the bank as a direct or indirect participant in its RTGS system, the payment should be forwarded to

²² The sending NCB may decide, for example, to re-credit the account of the originator and re-route the data or it may opt to credit an offset account to correct the payment data and repeat the transmission via the Interlinking.

²³ These procedures will be described in a separate paper.

that bank or its representative/correspondent, otherwise the payment should be rejected.

- If field 56A is not present but the receiving NCB/ECB is able to identify the bank in field 57A as a direct or indirect participant in its RTGS system, the payment should be forwarded to that bank or its representative/correspondent, otherwise the payment should be rejected.
- In addition, both the sending and receiving NCB/ECB must ensure that all BIC codes are valid. The current release of the S.W.I.F.T. BIC Directory has to be taken as a reference.

6.1.4.1.2 General Format

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 100	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
M	900	Interlinking Internal Reference	<IIR>
M	913	Time stamp	<DT>
M	20	Transaction Reference Number of Sending Credit Institution	16x
M	32A	Value Date Currency Code Amount	<u>6</u> n <u>3</u> a 15n
M	50	Ordering Customer	4*35x
M	52A	Ordering Institution	<BIC>
O	56A	Intermediary	[/1a]/[34x] <BIC>
M	57A	Account With Institution	[/1a]/[34x] <BIC>
M	59	Beneficiary Customer	/34x 4*35x
O	70	Details of Payments	4*35x
O	71A	Details of Charges	<u>3</u> a
O	72	Sender to Receiver Information	6*35x

6.1.4.2 MT198 sub 202 - General Financial Institution Transfer

6.1.4.2.1 Scope

This message is sent through the Interlinking by an NCB/ECB on its own behalf or at the request of a credit institution, to another NCB/ECB either for its own account or in favour of a credit institution.

It is used to order the movement of funds between credit institutions or NCBs/ECB via the Interlinking.

The following guidelines apply when sending an MT198 sub 202:

- The sending NCB/ECB should ensure that the original ordering institution is mentioned in field 52A (or the domestic equivalent). If this information is not

provided by the sending institution and the sending NCB is not able to provide the information, the payment must be rejected by the sending NCB/ECB.

- All parties to the transaction must be financial institutions.
- If field 56A is filled in, field 57A must be present too.
- If field 56A is filled in, and the receiving NCB/ECB is able to identify the bank as a direct or indirect participant in its RTGS system, the payment should be forwarded to that bank or its representative/correspondent, otherwise the payment should be rejected.
- If field 56A is not present, but field 57A is filled in, and the receiving NCB/ECB is able to identify the bank in field 57A as a direct or indirect participant in its RTGS system, the payment should be forwarded to that bank or its representative/correspondent, otherwise the payment should be rejected.
- If neither field 56A nor field 57A is present, and the receiving NCB/ECB is able to identify the bank in field 58A as a direct or indirect participant in its RTGS system, the payment should be forwarded to that bank or its representative/correspondent, otherwise the payment should be rejected.
- In addition, both the sending and receiving NCB/ECB must ensure that all BIC codes are valid. The current release of the S.W.I.F.T. BIC Directory has to be taken as a reference.

6.1.4.2.2 General Format

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 202	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>900</i>	<i>Interlinking Internal Reference</i>	<i><IIR></i>
<i>M</i>	<i>913</i>	<i>Time stamp</i>	<i><DT></i>
<i>M</i>	<i>20</i>	<i>Transaction Reference Number of Sending Credit Institution</i>	<i>16x</i>
<i>M</i>	<i>21</i>	<i>Related Reference</i>	<i>16x</i>
<i>M</i>	<i>32A</i>	<i>Value Date</i> <i>Currency Code</i> <i>Amount</i>	<i><u>6</u>n</i> <i><u>3</u>a</i> <i>15n</i>
<i>M</i>	<i>52A</i>	<i>Ordering Institution</i>	<i><BIC></i>
<i>O</i>	<i>56A</i>	<i>Intermediary</i>	<i>[/1a]/[34x]</i> <i><BIC></i>
<i>O</i>	<i>57A</i>	<i>Account With Institution</i>	<i>[/1a]/[34x]</i> <i><BIC></i>
<i>M</i>	<i>58A</i>	<i>Beneficiary Institution</i>	<i>[/1a]/[34x]</i> <i><BIC></i>
<i>O</i>	<i>72</i>	<i>Sender to receiver information</i>	<i>6*35x</i>

6.1.4.3 MT198 sub 110 - Payment Settlement Message Notification (PSMN)

6.1.4.3.1 Scope

This is the response to a Payment Settlement Message Request. This message can be either a positive or a negative acknowledgement. A positive acknowledgement indicates that the receiving NCB/ECB of the PSMR has successfully credited the payment to the receiving institution's settlement account. If the acknowledgement is negative, the message must also indicate the reason for not executing the payment by including the appropriate code word.

As long as the sending NCB has not received the related PSMN, the payment remains its responsibility.

A negative PSMN is also returned to the sending NCB/ECB in the case of receipt of a message whose message sub-type is not supported or not recognisable.

6.1.4.3.2 General Format

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 110	3n
M	77E	Proprietary Message	73x [n*78x]
M	900	Interlinking Internal Reference	<IIR>
M	913	Time stamp	<DT>
M	901	Referred Interlinking Internal Reference	<IIR>
M	910	ECB date and time of receipt	<DT>
M	990	Acceptance code	1n accepted = 0, rejected = 1
O	991	reason code for rejection	1a2n
O	72	Sender to receiver information	6*35x

6.2 SETTLEMENT OF NET-SETTLEMENT SYSTEMS

6.2.1 The User Requirement references

(UR 3.2.6.) *The Interlinking System will offer, on an optional basis, a service to settle balances arising from net-settlement systems with a strong cross border basis (the ECU clearing for example). For this purpose it has to provide a function that supports this service and affects the domestic RTGS systems as little as possible.*

6.2.2 The settlement service for net-settlement systems

Given the fact that at the start of Stage Three a net-settlement system (i.e. the ECU clearing system) will exist with participants that hold their accounts (needed for settlement) in different RTGS systems, the ESCB needs a mechanism to allow the settlement of the net balances of the participants. To meet this requirement, the following settlement mechanism has been agreed as far as the EBA Clearing is concerned:

The ECB will open in its books a central settlement account in the name of the EBA. Moreover, one or few NCBs may, if they so wish and in agreement with the EBA, open in their books a local settlement account to the EBA.

Net debtors in the EBA Clearing will settle their end-of-day position by sending payment orders to their respective account-keeping NCBs, through the local RTGS system, which would debit their accounts. TARGET would be used to channel the funds to the ECB holding the central settlement account of the EBA. However, net debtors located in a country where the NCB has opened a local settlement account to the EBA will send a local RTGS payment order for the benefit of that local EBA settlement account.

Once all net debtors have paid the amounts due, liquidity will be shifted between the central settlement account of the EBA at the ECB and the local settlement accounts of the EBA (where they exist) so as to provide these accounts with the money necessary to pay out the banks with a net credit position (long banks).

Long banks will be paid out from the settlement account of the EBA at the ECB via cross-border TARGET payment or, to the extent that they are located in a country where the NCB has opened a local settlement account to the EBA, from that local settlement account via a domestic RTGS system.

6.3 END-OF-DAY CONTROL OPERATIONS

6.3.1 The User Requirement references

(UR 3.4.) At the end of the day, but before final closing of the Interlinking System, each NCB provides to the ECB a message with end of day information to check whether all payment messages were exchanged correctly.

The end of day control procedures have to be finalised by a positive answer from the ECB. If a negative answer is received, the involved NCBs/ECB have to initiate and finalise error detection procedures in the period of thirty minutes (as a standard end of day operation time that could be exceeded under disadvantageous circumstances).

No participating NCB may end its TARGET business day within before it has established final positions with its bilateral partners²⁴.

6.3.2 The function of the end-of-day control operation

Bearing in mind the general design of the Interlinking network, particularly in relation to the function of acknowledgements, the end-of-day control operations will ensure, on a technical basis, that all bilateral operations conducted during the day match each other. Therefore, an ECMR can only contain information relating to counterparties with whom no known PSMRs/PSMNs are still pending. The ECB will perform the following controls:

- check that the highest IIR sent by an NCB/ECB to another NCB/ECB has been received and vice versa;

²⁴ If the reason for discrepancy is purely a technical one, and has no impact on a secure finalisation of the business day, NCBs/ECB could decide to end the business day and solve the technical problem 'off-line'.

- check that the total credit turnover and the total debit turnover of the cross-border payments, positively acknowledged between the NCBs/ECB during the business day, match each other;
- ensure that the next three business dates and times are correct.

The controls are performed by the ECB.

6.3.3 Flow of messages

6.3.3.1 *The procedures*

When they reach their official closing time, NCBs may no longer issue payment request messages. Nevertheless, the closing NCBs have to stay open to receive and process late incoming payments, which may still be travelling on the network. Therefore, NCBs have to wait 30 minutes²⁵ after their official closing time, before the end-of-day procedures²⁶ can start. Each NCB should keep track of the working hours of the other NCBs. NCBs remaining open have to send the figures relating to closing NCB(s), no earlier than 30 minutes after the registered closing time.

At 18.30 (ECB time) the NCBs/ECB will gather daily information concerning Interlinking messages sent and received (highest IIR), as well as bilateral turnover (debit and credit) resulting from positively acknowledged payments. Based on these figures, they will send an Interlinking standard message, the End-of-day Check Message Request (ECMR), to the ECB with figures concerning the NCBs from which they have received all the expected PSMNs and to which they have sent all known PSMNs. The information reported to the ECB will ensure that the cross-border payments sent from the closing NCB(s) to the other NCBs/ECB, as well as traffic from the other NCBs/ECB to the closing NCB(s), match each other.

If an NCB receives a payment order through the Interlinking after the start of the end of day procedure, but before having sent the ECMR for the sending NCB, it processes the payment and sends the appropriate acknowledgement and then sends the ECMR to the ECB. If the payment is received through the Interlinking after the ECMR has been sent, the receiving NCB processes the payment and sends the appropriate acknowledgement and waits for the negative End-of-day Check Message Notification (ECMN) from the ECB. It then sends the correct ECMR. If the payment is received through the Interlinking after 20.00 and no bilateral agreement has been achieved within the framework of bilateral error handling, the receiving NCB has the right to reject the payment.

The ECB may send ECMNs at regular intervals for any set of newly matched figures. As soon as bilateral relationships of a NCB are successfully matched the notification sent by the ECB will comprise information on this successfully matched data. The matching process consists of a comparison between the bilateral figures received. After matching, the ECB will send an ECMN to each participant. The notification will comprise details of successfully matched data, unsuccessfully matched data, or both. If the message mentions unmatched data, bilateral error procedures²⁷ have to start between the NCBs/ECB

²⁵ 30 minutes should be considered a maximum time and might be reduced, according to experience. Other dates mentioned in this chapter should also be seen as parameters which might be changed according to experience.

²⁶ The procedures described are valid either for common or non-common closing hours.

²⁷ These will be described on a separate note.

involved. After having established common closing figures, both NCBs/ECB should send a new ECMR to the ECB, this time relating only to the previous unmatched figures.

If a disaster has happened and the enforced closing procedure is activated, then all “unaffected” NCBs (and the ECB) send their ECMR to the ECB as normal (including figures for the NCB in trouble). The NCB experiencing the disaster also sends to the ECB, if possible, its figures (e.g. by fax or other communication). The ECB will then match the figures of the non-affected NCBs as normal and, if possible, check the matching of the data provided by the affected one. The figures provided by the non-affected NCBs in relation to the affected NCB will be stored by the ECB in order to allow these to be checked against data provided by the affected NCB once it has recovered. In case it is not possible to get end of day figures from one NCB, then the ECB manually introduces figures for the missing NCB, relying in particular on the bilateral figures provided by other NCBs.

If it is the ECB that experiences the disaster situation, then either the end of day matching should be postponed until the ECB has recovered, or the ECB could use a back-up system that is capable of conducting the matching .²⁸

The closing NCBs can only terminate their business day after receiving a positive ECMN from the ECB for all bilateral checks.

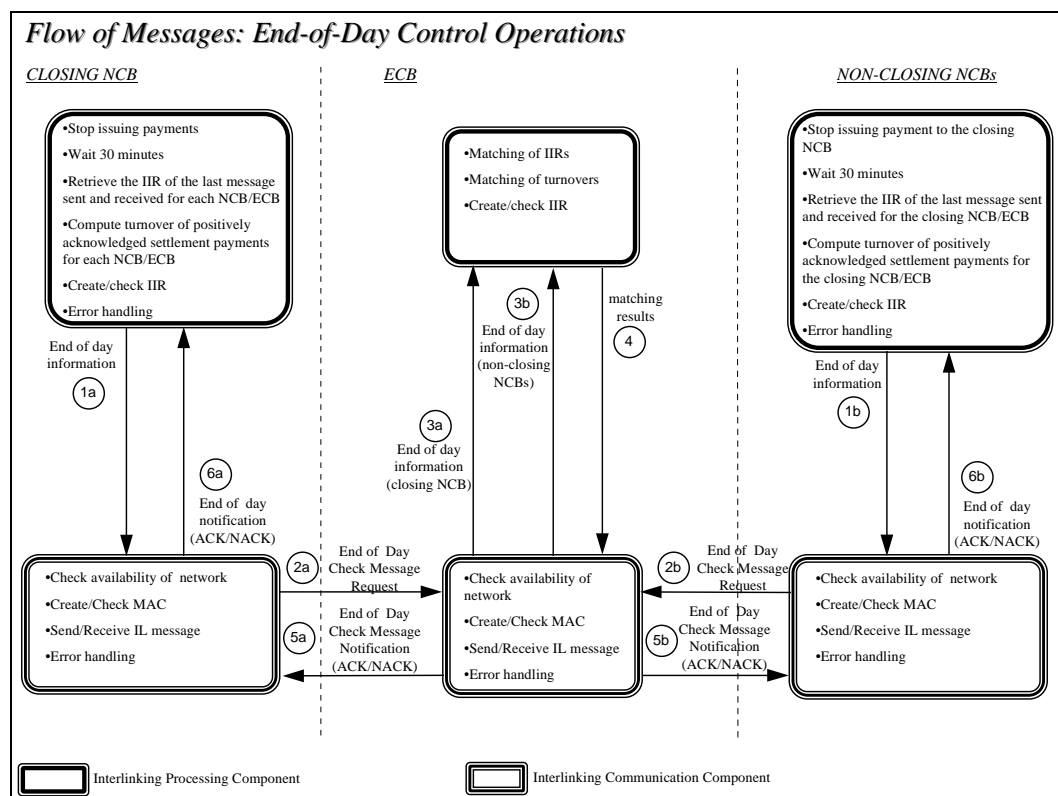


Figure 0-3 - End-of-day Control Operations

6.3.3.2 The notification

The notification ECMN can be either:

²⁸ If necessary, and unless otherwise agreed, the procedure can be performed manually by the ECB.

- successful, for matching figures;
- unsuccessful, for non-matching figures; or
- negative.

The End-of-day Check Message Notification (ECMN), issued by the ECB, includes the result of the matching for one or more NCBs. The ECMN should reach the NCBs not later than 30 minutes after the ECMRs were sent. Unsuccessful matching will be notified as soon as possible to both NCBs. Therefore, the ECB could send more than one ECMN to any NCB(s) if it detects non-matching figures but has not yet received them all.

A negative ECMN containing a Syntax Error block only, will be returned to the issuer of the ECMR either in case of syntax error or if the business dates and times do not match with those held by the ECB.

6.3.3.2.1 *Unsuccessful matching*

In the case of unsuccessful matching, the relevant NCBs/ECB will be notified by the ECB and given the unmatched figure(s) of the other NCB/ECB. Upon receipt of this notification, each party must initiate Error Detection Procedures. When all the required actions have been undertaken, the involved NCBs will resend their End-of-day Check Message Request (ECMR), but this time only with the new bilateral figures.

In order to help determining the payment(s) responsible for the unsuccessful matching, the following algorithm has to be implemented:

Suppose that 10,000 payments have been exchanged during the day between NCB A and NCB B. The payments are sorted by IIR. Each NCB calculates the total of the first 5,000 payments and the total of the 5,000 remaining ones. If the first totals do not match, each NCB calculates the total of the first 2,500 payments and the total for the remaining 2,500. The same procedure is then used until the erroneous message is pin-pointed. If the total of both the first half and the second half of the payments do not match, this indicates that either more than one payment is in error or that one payment is not correct and another is missing. When the number of remaining payments to be split for calculating the totals is even, the first total is calculated on the first n payments where $n = \text{int}(\text{number of remaining payments} / 2)$ and the second total on the remaining payments. Thirteen iterations of this procedure are sufficient to identify the payment if there are a total of 10,000 payments and 17 iterations if there are 100,000 payments.

In addition, the sending NCB/ECB should be able to justify any gaps in the IIRs received by the receiving NCB/ECB which were caused by special action on the part of the sending NCB/ECB, e.g. a PSMR has been cancelled after the IIR has been generated, but before the message was sent.

6.3.3.2.2 Open matching

If the ECB does not receive the ECMR relating to a closing NCB, either from the closing NCB itself or from other NCB, at least 45²⁹ minutes after the normal closing time of a closing NCB, it will send an Interlinking Free Format Message (IFFM) to the relevant NCB³⁰, reminding them that the information has not been received yet. At the ECB level, the processing of matching for the participants involved will be kept open until all information has been received.

The same procedure applies if 15 minutes after the ECB receives information concerning a bilateral relationship between NCBs from one NCB, it has not heard from the other NCB concerned. For example, if NCB A provides figures concerning NCB B to the ECB at 18.50, the ECB contacts NCB B at 19.05 if it has not received from NCB B its figures relating to NCB A

6.3.4 Message types

6.3.4.1 MT198 sub 111 - The End-of-day Check Message Request (ECMR)

6.3.4.1.1 Scope

This message is sent to the ECB by an NCB that wants to initiate its End-of-day Control Procedures, or by NCBs which are aware that other NCBs want to initiate these procedures. The message will contain information concerning the PSMRs exchanged during the current business day with other NCBs and the ECB.

It also includes the next three business dates and times of the sending NCB.

6.3.4.1.2 Message format.

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 111	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>900</i>	<i>Interlinking Internal Reference</i>	<i><IIR></i>
<i>M</i>	<i>913</i>	<i>Time stamp</i>	<i><DT></i>
<i>M</i>	<i>998</i>	<i>Action on behalf</i>	<i><u>1</u>n 0 - closing NCB 1 - non-closing NCB</i>
M	994	Counterparty	<CC>
M	902	Highest bilateral IIR sent	<IIR>
M	903	Highest bilateral IIR received	<IIR>
M	996	Debit Turnover	<CC><CC>18n
M	997	Credit Turnover	<CC><CC>18n
M	912	Next 3 business dates-times	<DTT> <DTT> <DTT>

²⁹ This means 15 minutes (maximum travelling time) after the 30 minutes NCBs have to wait before sending their ECMR.

³⁰ A telephone call can also help to solve potential problems.

6.3.4.2 MT198 sub 112 - The End-of-day Check Message Notification (ECMN)

6.3.4.2.1 Scope

This message is sent by the ECB to the NCBs to notify them of the result of the End-of-day Control Procedures, to report on any syntax validation error in the ECMR, or to inform them that the business dates and times included in the ECMR do not match those held by the ECB.

Depending on the way the ECB organises its matching procedure, the ECMN may contain result information for one or several NCBs.

It includes also the next three business dates and times for each NCB. These dates supersede any other dates exchanged previously.

6.3.4.2.2 Message format.

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending ECB	16x
M	12	Sub-Message Type 112	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
M	900	Interlinking Internal Reference	<IIR>
M	913	Time stamp	<DT>
M	901	Referred Interlinking Internal Reference	<IIR>
Syntax Error block			
M	990	Acceptance code	'1'
M	991	reason code for rejection	<u>1a</u> 2n
O	72	Sender to receiver information	6*35x
Successful block			
M	990	Matching status	<u>1</u> n 0 - successful
M	994	Counterparty	<CC>
M	902	Highest bilateral IIR sent	<IIR>
M	903	Highest bilateral IIR received	<IIR>
M	996	Debit Turnover	<CC><CC>18n
M	997	Credit Turnover	<CC><CC>18n
M	912	Next 3 business dates-times	<DTT> <DTT> <DTT>
Unsuccessful block			
M	990	Matching status	<u>1</u> n 1 - unsuccessful
M	994	Counterparty	<CC>
M	902	Highest bilateral IIR sent	<IIR>
M	903	Highest bilateral IIR received	<IIR>
M	996	Debit Turnover	<CC><CC>18n
M	997	Credit Turnover	<CC><CC>18n
M	912	Next 3 business datse-times	<DTT> <DTT> <DTT>

6.4 DELAY CLOSING TIME OPERATIONS

6.4.1 The procedures

Normally, it should not be necessary for an NCB/ECB³¹ to request other NCBs to delay the closing time of their Interlinking and RTGS components. This might arise, for example, when an NCB has had technical problems during the day³² and needs extra time to send payment messages which are pending. The NCB facing end-of-day closing problems should send all NCBs which are still operating³³ and the ECB, a **Delay Closing Time Request (DCTR)** message. This message is similar to a Payment Settlement Message Request (PSMR) in that it requires an acknowledgement.

The delayed closing time procedure can be initiated when an NCB or the ECB needs to allow new (critical) payments to be received and debited after the TARGET 18.00 closing time and, as a result, request all other NCBs to postpone their closing time. In a delayed closing time procedure, cross-border payments can be sent “in both directions” between the NCBs³⁴. All NCBs/ECB have to acknowledge positively the DCTR with a **Delay Closing Time Notification (DCTN)**.

The delayed closing time request shall be sent to all NCBs and to the ECB.³⁵ In case the request is made after 17.00, the NCB which requires a delayed closing time needs to inform at least the ECB through another communication channel³⁶. If an NCB wishes to send a DCTR after 17.45 it is obliged to ask the ECB for agreement to a postponement of the closing time. If the request is approved, the ECB will request the other NCBs to postpone the closing time by sending a delayed closing time message.

The ECB is entitled to postpone the TARGET closing time until 20.00 at a maximum. If the problem has not been resolved by then, a disaster management procedure is to be initiated by the ECB.³⁷ If the request is approved, the ECB will request the other NCBs to postpone the closing time by sending a delayed closing time message. A request to postpone the closing time must be accepted if:

- the request is received from an NCB by 18.00³⁸ at the latest and new closing time will not be later than 19.00 (i.e. a maximum total delay of one hour), or
- the request is received from the ECB.

A DCTR received from the ECB overrides any delay closing time request received earlier.

³¹ The ECB will act like any other participant through its Payment Mechanism.

³² Due to the number of communication and operational systems involved, this situation is not at all unlikely, in spite of backup systems.

³³ The message should indicate in field 72, if possible, which NCB/ECB will receive late payments.

³⁴ Criteria for the use of the DCTR will be elaborated separately.

³⁵ The TTF agreed that the technical tools allowing for a partial closing (i.e. that some NCBs close while other stay open) will be retained in the Interlinking specifications.

³⁶ To be defined within the framework of the Daily Management of the TARGET system.

³⁷ Unless the majority of the settlement managers of the NCBs and the TARGET co-ordinator have agreed otherwise. The TTF agreed that the (limited) possibility to postpone the closing time beyond 20.00 should not be made public.

³⁸ Since the maximum transmission time through the network is 15 minutes, the message has to be sent by 17.45.

The end of day control functions will start 30 minutes after the new closing time indicated in (field 914 of) the DCTR message, unless the ECB decides to shorten this time period (by sending a new DCTR to all NCBs or, where appropriate, informing all NCBs through another communication channel), taking due account of the time lag needed for PSMNs for all PSMRs to be sent and received by the NCBs.

If the ECB has given some NCB(s) the authorisation to close despite a delayed closing time procedure having been initiated, then all NCBs have to send their first ECMR at the time indicated by the ECB so as to allow the unaffected NCB(s) to close. The ECB does not check the bilateral data for any pair of NCBs which are still open.

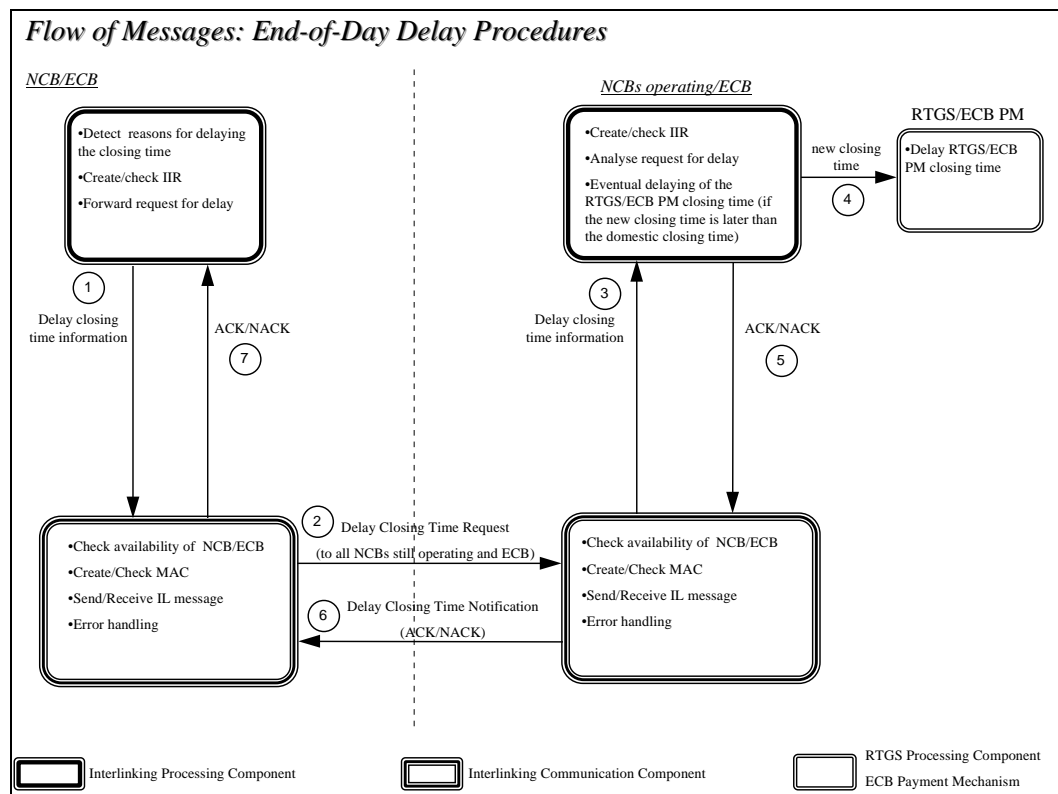


Figure 0-4 - End-of-day Delay Procedures

6.4.2 Message types

6.4.2.1 MT198 sub 113 - Delay Closing Time Request (DCTR)

6.4.2.1.1 Scope

This message is sent by an NCB/ECB facing problems to all other (still operating) NCBs and the ECB to request them to delay the start of the End-of-day procedures. NCBs/ECB are requested, if possible, to leave their systems running. With regard to those NCBs/the ECB that did not ask for the delay, NCBs whose RTGS system has a queuing mechanism cannot accept new payments after the 18.00 closing time (unless otherwise agreed between the ECB and NCBs) while NCBs whose RTGS systems do not provide queuing

may re-input payments that have already been rejected.³⁹ A Delay Closing Time Notification (DCTN) reply must be sent to this message.

6.4.2.1.2 Message format.

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 113	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>20</i>	<i>Sender reference</i>	<i>16x</i>
<i>M</i>	<i>913</i>	<i>Time stamp</i>	<i><DT></i>
<i>M</i>	<i>914</i>	<i>New closing time</i>	<i><DT></i>
<i>M</i>	<i>991</i>	<i>Reason code</i>	<i><u>1a2</u>n</i>
<i>O</i>	<i>72</i>	<i>Sender to receiver information</i>	<i>6*35x</i>

6.4.2.2 MT198 sub 114 - Delay Closing Time Notification (DCTN)

6.4.2.2.1 Scope

This message is the response to a Delay Closing Time Request (DCTR). It can be either a positive or a negative acknowledgement. A positive acknowledgement implies that the receiver agrees to the new closing time. If the notification is negative, the returned error code should state the reason for not agreeing to the request. As with any other notification, this message should be received by the requesting NCB within 30 minutes of the dispatch of the DCTR.

6.4.2.2.2 Message format.

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 114	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>20</i>	<i>Sender reference</i>	<i>16x</i>
<i>M</i>	<i>21</i>	<i>Related reference</i>	<i>16x</i>
<i>M</i>	<i>913</i>	<i>Time stamp</i>	<i><DT></i>
<i>M</i>	<i>910</i>	<i>ECB date and time of receipt</i>	<i><DT></i>
<i>M</i>	<i>990</i>	<i>Acceptance code</i>	<i><u>1</u>n</i> <i>accepted = 0, rejected = 1</i>
<i>O</i>	<i>991</i>	<i>Reason code for rejection</i>	<i><u>1a2</u>x</i>
<i>O</i>	<i>72</i>	<i>Sender to receiver information</i>	<i>6*35x</i>

³⁹ This arrangement is based on the fact that, in RTGS systems without queuing facilities, some payments might have been rejected which, if they had been made through an RTGS system that provided queuing, would have been placed in the queue. As a result, it is agreed that payments can be re-input into the RTGS systems without queuing facilities. In a delayed closing time procedure, payments pending in a queue at 18.00 can be debited until the new closing time.

6.5 GENERAL PURPOSE MESSAGES

6.5.1 Message types

6.5.1.1 MT198 sub 115 - Interlinking Free Format Message (IFFM)

6.5.1.1.1 Scope

This message is used to carry any kind of data or information which is not covered in §0, §0, §0, §0, §0, §0 or §0. It should be used e.g. by the ECB to warn a participant that end of day information is missing.

The content of the message is not standardised and therefore cannot be handled automatically.

6.5.1.1.2 Message format

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 115	3n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>20</i>	<i>Sender reference</i>	<i>16x</i>
<i>M</i>	<i>21</i>	<i>Related reference</i>	<i>16x</i>
<i>M</i>	<i>999</i>	<i>Free Format Text</i>	<i>73x</i> <i>[n*78x]</i>

6.6 THE ABILITY TO RESEND MESSAGES

Circumstances have been identified in TARGET where a sending NCB needs to resend a previously sent message. This is the case for example if a PSMR was sent but never received and is therefore still open at the sending NCB. For this reason, each NCB has to be capable of resending an exact copy of a previous message. Because this is a duplicated message, the same IIR has to be re-used. After processing, if relevant, a notification is returned to the sending NCB.

Because the original message and the duplicated ones use the same IIR, NCBs/ECB have to ensure that only one copy of the message is processed and, if relevant, notification sent. Therefore, any incoming message carrying an IIR which has already been processed will be ignored. Nevertheless, any duplicate message received should be stored by the receiving NCB/ECB for audit trail purposes.

NCBs/ECB are free to implement the resend function in their Interlinking component or to use the functionality offered by their CBT.

6.7 THE ABILITY TO SIMULATE NOTIFICATIONS

Under normal circumstances, the life cycle of a PSMR/ECMR is closed when the sending NCB/ECB receives a (positive or negative) notification for that message. However, in some cases, mainly in disaster situations or in enforced closing of TARGET, the receiving NCB/ECB may no longer be in a position to send those notifications.

Therefore, each NCB/the ECB has to be capable of simulating on its system the reception of a PSMN/ECMN.

This procedure has to be used with great care, and needs a formal agreement by both the sending and the receiving NCB/ECB.

6.8 THE ABILITY TO STOP SENDING PAYMENTS

In cases in which an NCB or the ECB has technical problems and has to close down its systems during the business day, it informs the other Interlinking participants and the ECB as soon as possible. The receiver of this information then has to stop sending payments to that participant. In addition, according to national rules, the receiver may decide to: i) inform its credit institutions; ii) stop debiting payments bound for this NCB; iii) stop accepting cross border payments bound for the NCB facing problems.

After successful recovery, all NCBs and the ECB have to be informed immediately.

7. ENSURING AVAILABILITY, SECURITY AND MINIMUM CAPACITY

This chapter has been removed from the Interlinking Specifications. Security issues for the Interlinking are now covered in the document TARGET Security Requirements which are now part of the technical annexes to the TARGET report.

8. RESPONSIBILITIES

8.1 RTGS SYSTEMS AND THE INTERLINKING WITHIN TARGET

TARGET as a whole is composed of national RTGS systems, the ECB payment mechanism and the Interlinking.

National RTGS systems and the ECB Payment Mechanism comprise:

- an IT system which provides final and irrevocable debiting and crediting functions along with some optional features like queue management, debit advice, credit advice; and
- telecommunication facilities for the real-time transmission of payment orders and additional information between banks and the NCBs/ECB.

The Interlinking comprises:

- an IT system which provides inter-NCB/ECB accounts for recording mutual claims and liabilities stemming from payment transfers; and
- a telecommunication network for the real-time transmission of Interlinking data.

8.2 RESPONSIBILITY OF THE NCBS/ECB AND S.W.I.F.T.

8.2.1 Communication functions

8.2.1.1 Availability of systems and link facilities

- S.W.I.F.T. is responsible for the provision of a reliable telecommunications network (including the FIN service);
- NCBs and the ECB are responsible for the provision of a reliable RTGS system and a reliable link to S.W.I.F.T. SAPs.

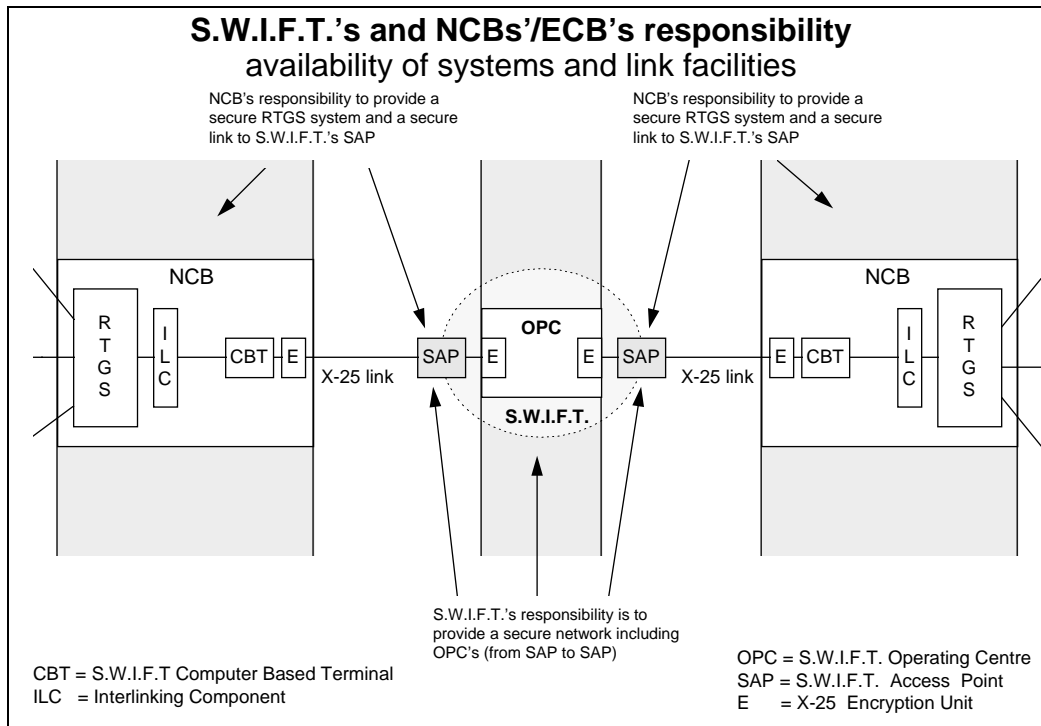


Figure 0-1 - Availability of systems and link facilities

8.2.1.2 Physical and logical access control

- S.W.I.F.T. is responsible for the provision of adequate access control for their telecommunication services on all layers.
- NCBs and the ECB are responsible for access control to their CBTs and encryption units (Interlinking front end components) and all other kinds of access to their RTGS system/the Interlinking component.

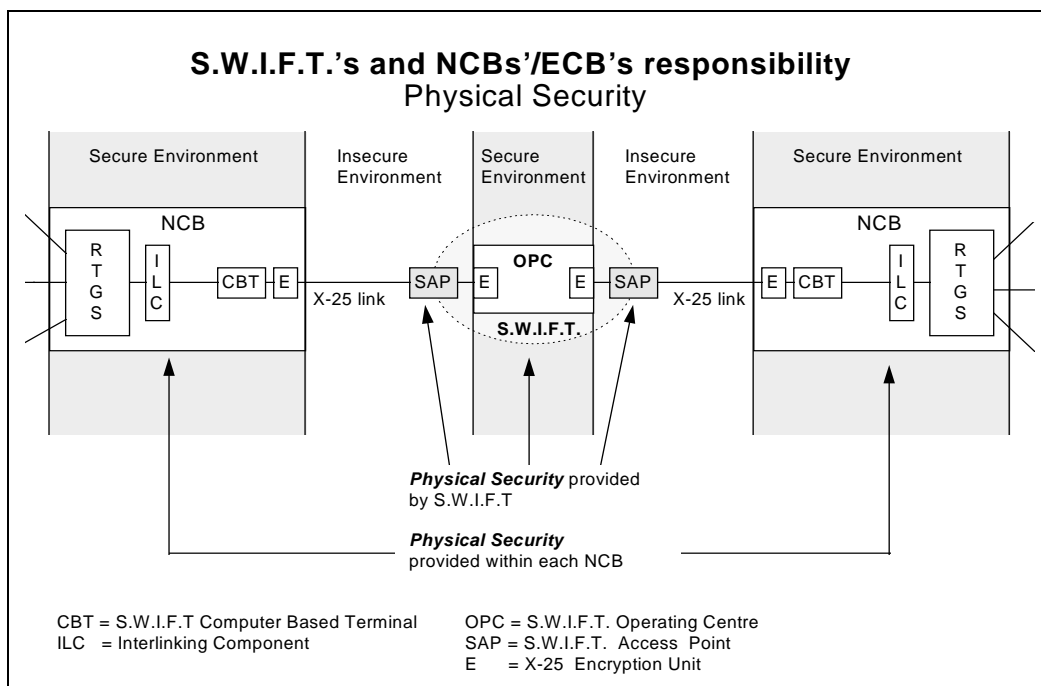


Figure 0-2 - Physical security

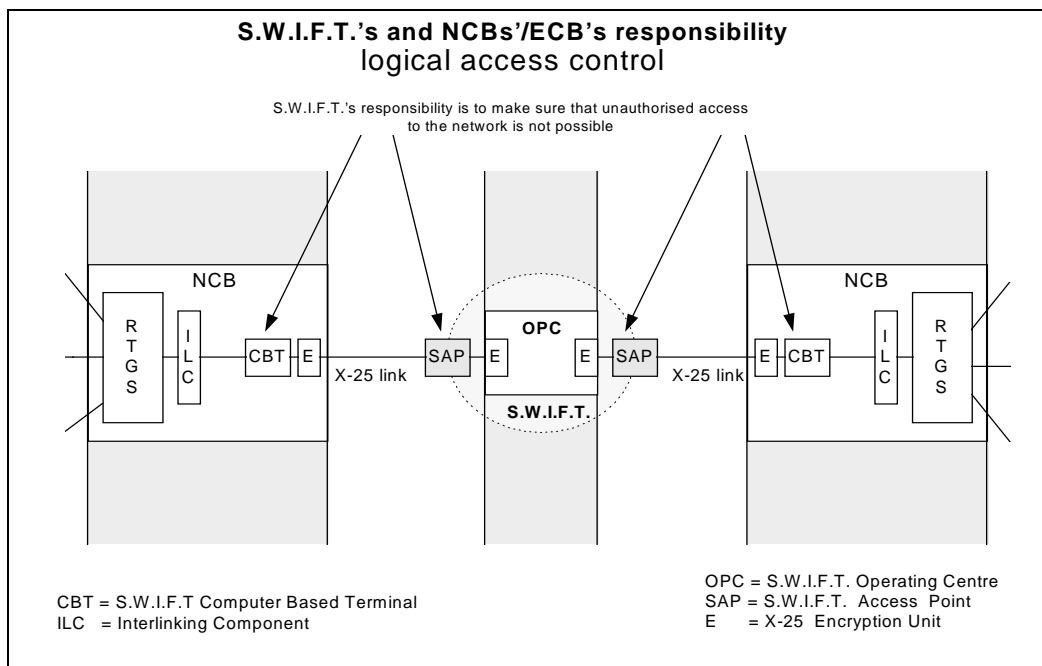


Figure 0-3 - Logical access control

8.2.1.3 Message delivery

- S.W.I.F.T.'s responsibility starts when a message is acknowledged by the OPC and S.W.I.F.T.'s responsibility is finished when the OPC has received an acknowledgement from the receiving CBT.
- NCBs and the ECB are responsible for reliable data management (including delivery and processing time-span monitoring) outside this network functionality.

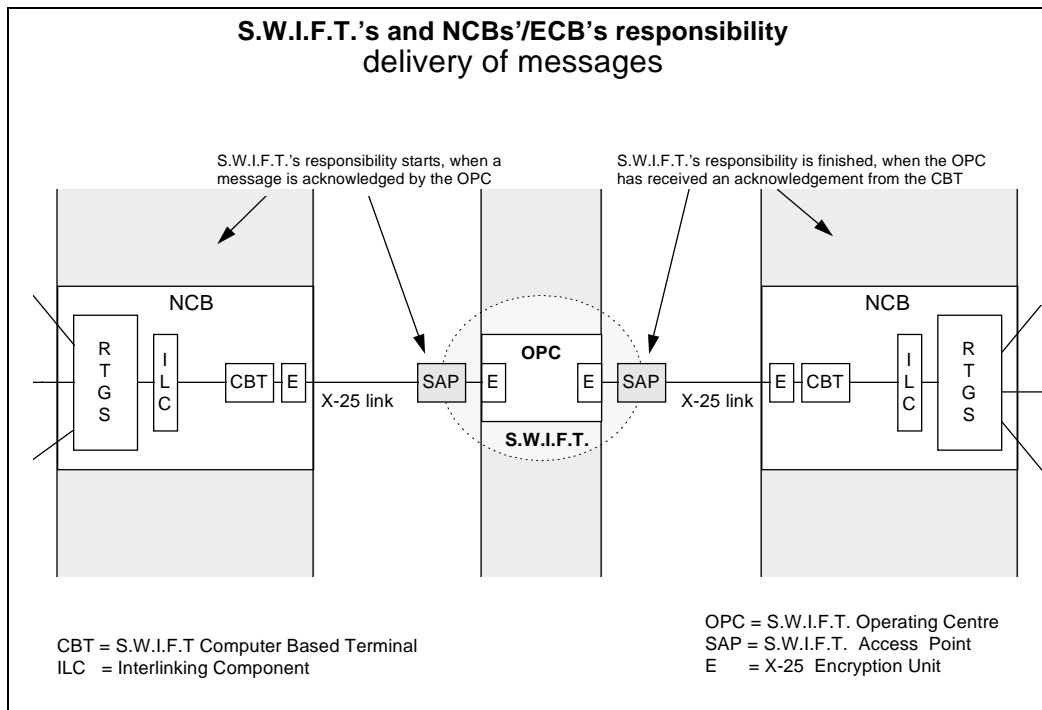


Figure 0-4 - Delivery of messages

8.2.1.4 Data confidentiality during communication

- S.W.I.F.T. is responsible for the provision of secure encryptors (including key management facilities);
- NCBs and the ECB are responsible for the secure installation of the encryptors and the provision of technical facilities capable of ensuring sufficient confidentiality of the data at a national level.

Suppose line encryption were to be chosen.

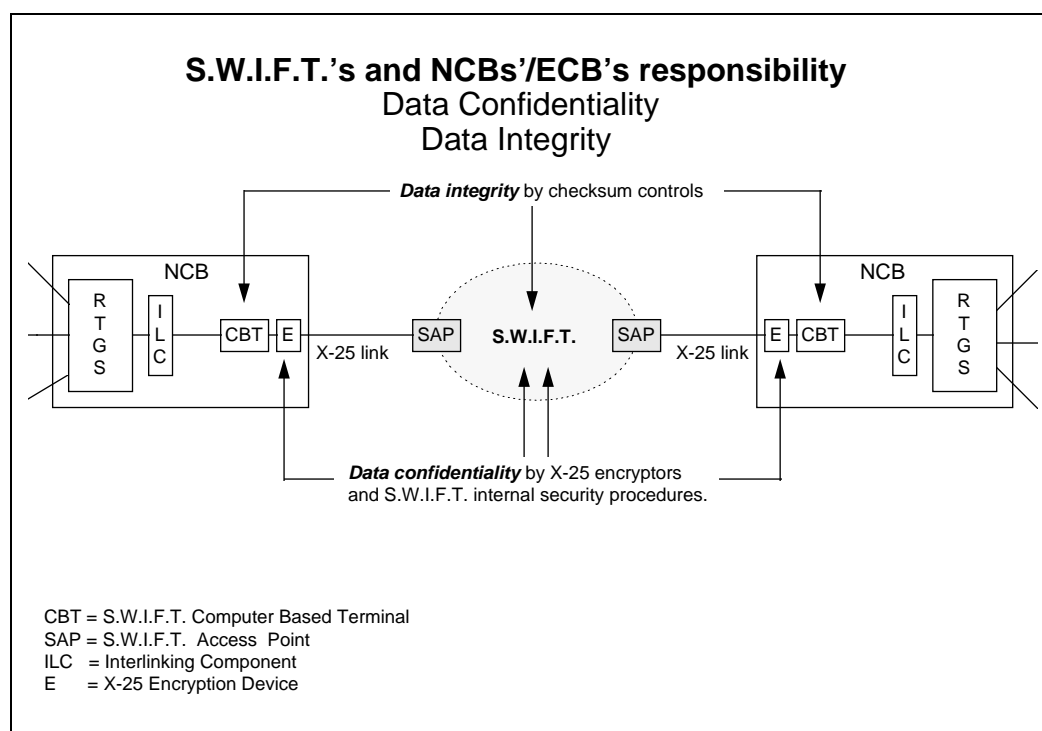


Figure 0-5 - Data confidentiality and Integrity

8.2.1.5 Data integrity

- S.W.I.F.T. is responsible for the provision of a secure method for checking data integrity between CBT and OPC and vice versa;
- NCBs and the ECB are responsible for protection of data integrity outside this telecommunication link (see *Figure 0-5*).

8.2.1.6 Data authenticity

- S.W.I.F.T. is responsible for the provision of a secure method which allows data authenticity checks between the sending NCB/ECB and receiving NCB/ECB.
- NCBs and the ECB are responsible for the secure implementation of the method and protection of data authenticity outside this telecommunication link.

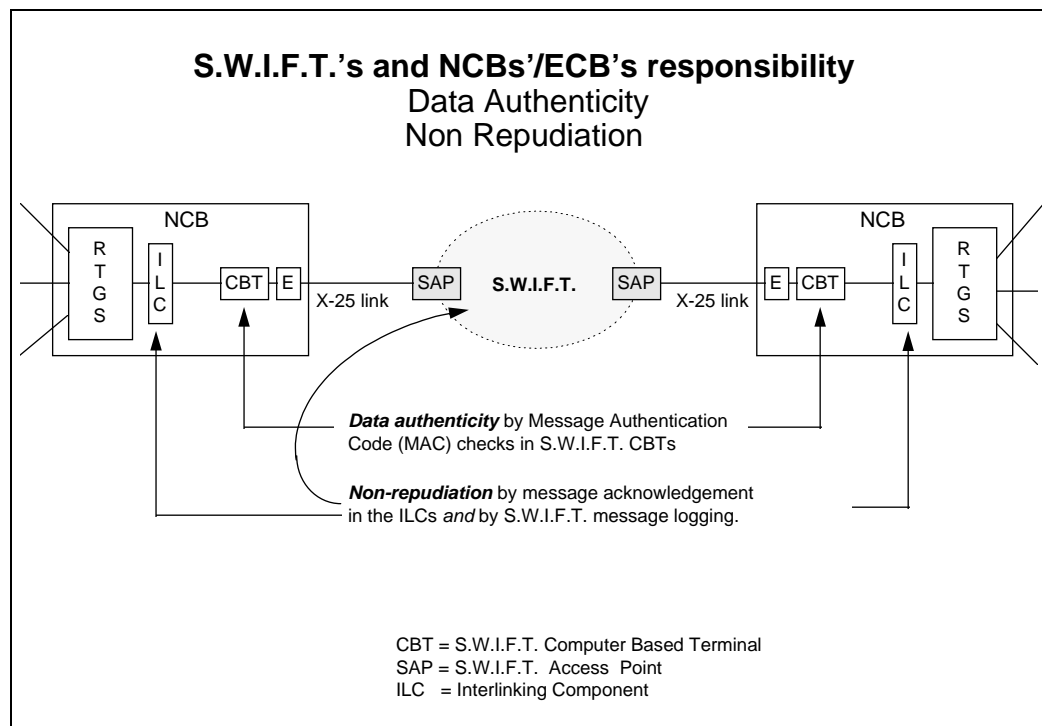


Figure 0-6 - Data Authenticity, Non-repudiation

8.2.1.7 Non-repudiation between sending NCB/ECB and receiving NCB/ECB

- S.W.I.F.T. is responsible for the provision of secure long-term storage of data, to act as a 'trusted third party' in the case of a dispute between the sending NCB/ECB and receiving NCB/ECB (see *Figure 0-6*).

8.2.1.8 Tools for a secure authentication key exchange

- S.W.I.F.T. is responsible for secure design of the methods (Bilateral Key Exchange), the provision of secure tools (card reader) and its own reliability work as a 'certification authority';

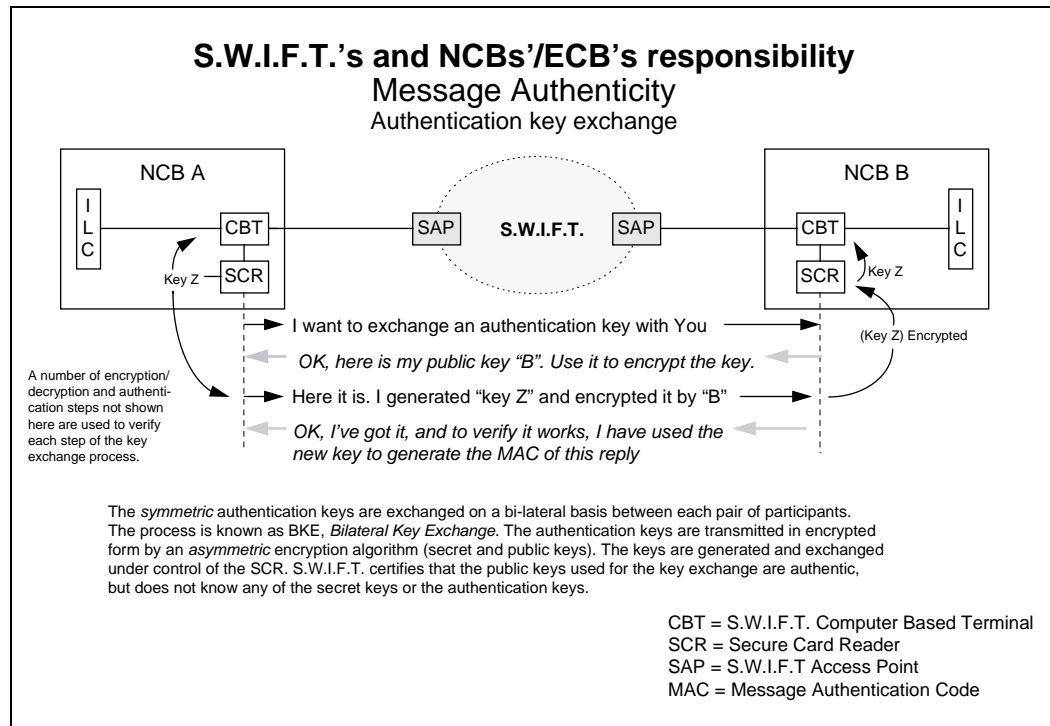


Figure 0-7 - Authentication key exchange

- NCBs and the ECB are responsible for the secure implementation and handling of methods and tools (BKE/card reader) and secure key storage on the CBTs.

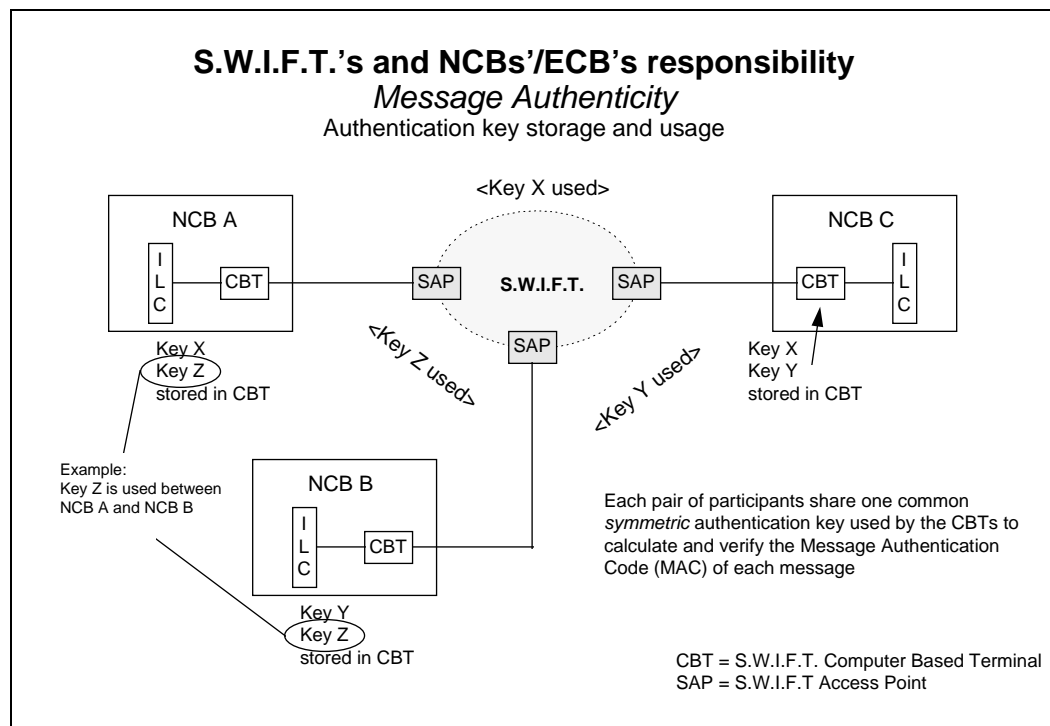


Figure 0-8 - Message authenticity

8.2.2 Business application functions

These functions are described in §6 of this specifications. They are mainly

- logical structure of the communication (e.g. request/acknowledgement structure);
- tasks that have to be fulfilled in a specific time-span (e.g. start of error detection measures);
- data presentation requirements (e.g. definition of message types).

Each NCB and the ECB is responsible for its individual system. Because the application layer of TARGET is completely independent from the underlying network, no further entity takes responsibility.

The application functions will have to be embedded in a set of operational rules. It may be adequate to provide these rules in the form of handbooks (e.g. similar to S.W.I.F.T.). These handbooks should clarify in detail the different tasks of the NCBs and the ECB and should distinguish clearly the responsibilities of the parties involved. These handbooks will be internal to the NCBs/ECB. They will be provided during the development and implementation phase of the Interlinking System.

9. OPEN DESIGN ISSUES AND THE CURRENT STAGE OF THE SPECIFICATION PROCESS

9.1 OPEN DESIGN ISSUES

9.1.1 The settlement of Net Settlement systems

The current stage of work is described in the report “*The Settlement of the EBA Clearing System in TARGET in Stage Three of EMU*”.

9.1.2 Volume of transactions

Because a precise assessment of the likely volume of Interlinking payments was not possible, the current design is based on the tenets of individual responsibility of each NCB/ECB for their systems and S.W.I.F.T.’s capability of adjusting all components with a short lead time. However, during the next project phases, when more details of the TARGET system will be published, the NCBs and the EMI should aim at a more precise assessment of TARGET transactions. The estimation of volumes should be done in co-operation with the banking industry.

9.1.3 TARGET message pricing

The discussion on how messages will be charged in TARGET is not yet finalised.

9.1.4 Error handling procedures

A draft report is now available. Functional requirements identified in this report are described in these specifications.

9.1.5 End-to-end confidentiality

S.W.I.F.T.’s security strategy is now finalised. After publication, potential solutions will be examined.

9.1.6 The relationship between non-euro area NCBs within EU

No explicit decision has been taken yet on this issue (and it is not certain that such a decision would be needed).

9.2 CURRENT STAGE OF THE SPECIFICATION PROCESS

The Interlinking Specifications are based on the User Requirements describing core features required for the smooth functioning of the cross-border settlement of payments via interlinked individual RTGS systems. It provides tools which will be used for core business purposes.

As described earlier, some design issues are still open. They will be closed in the near future.

10. GLOSSARY OF TERMS

- A -

AAU - see **Automatic Answer Unit**

ACK - A positive acknowledgement, sent by the receiving system to the sender, after having successfully processed a request message.

Asymmetric - An encryption method that allows data to be encrypted using one key and to be de-encrypted with a second unique key.

Authentication - Generic term for a check performed to ensure that two parties are communicating with each other and not with a fraudulent third party. Successful authentication of SWIFT messages also confirms that message content has remained unchanged during transmission.

Automatic Answer Unit - An automatic answering unit is installed at each RP to provide an up-to-date report on the status of the RP.

Availability - Criterion on which a system is evaluated taking into account back-up facilities and the possibility of switching over to them.

- B -

Bank Identifier Code - A universal method of identifying financial institutions in order to facilitate the automated processing of telecommunication messages in financial environments.

BIC - see **Bank Identifier Code**

BKE - Bilateral Key Exchange

BSC - Proprietary S.W.I.F.T. communication protocol for the link between CBT and SAP.

- C -

CBT - see **Computer Based Terminal**

Checksum - Method used to check that no data have been lost or changed during the communication process.

Computer Based Terminal - A network interface device, provided and operated by the user, consisting of both hardware and software.

Confidentiality - The process of ensuring that data are not disclosed to those not authorised to see them.

Cut-off Time - The latest time of day (by country/time zone) for receiving NCBs/ECB to apply same-day value to effect funds transfers in favour of third parties. It is also the time after which users will receive an end-of-day report.

- D -

DCTN - see **Delay Closing Time Notification**

DCTR - see **Delay Closing Time Request**

Delay Closing Time Request - Request message used when a NCB/ECB faces problems in sending its payment messages in due time. By using this message other NCBs/ECB are asked to stay open to process late payments. A notification from the receiver is required.

Delay Closing Time Notification - Answer to a DCTR. Can be either positive or negative.

- E -

ECB - European Central Bank

ECMN - see **End-of-day Check Message Notification**

ECMR - see **End-of-day Check Message Request**

Encryption - A process whereby the characters which constitute a readable message are encoded using a cipher so as to render that message unintelligible to other parties.

End-of-day Check Message Notification - Response to a ECMR. It can report either successful and unsuccessful matching.

End-of-day Check Message Request - The sender of this message is requesting the initiation of End-of-day procedures. A positive or negative Request Received and Processed Notification must be issued by the receiver of the ECMR (i.e., the ECB).

End-to-end encryption - Method used to assure confidentiality of data at the application level; it means the encryption algorithms are implemented together with the application.

Error detection procedures - Methods used by the NCBs/ECB to detect and solve errors during the business day.

ESCB - European System of Central Banks.

Euro area - Collection of countries which have adopted the single currency.

- F -

Fallback - The process of returning to the mode of operation, or of network connection, previously used, in the event of serious problems.

Field - A data element for which the identification, description and value representation has been pre-defined. Each element constitutes an indivisible unit. Where a field consists of more than one element, each forms a sub-field.

Fields may be:

- Fixed or variable length
- Mandatory or optional
- Restricted in the character set that may be used.

A field can appear only once in a message, unless the rules specify otherwise. Some fields consists of several sub-fields.

FIN - see **Financial Application**.

Financial Application - The S.W.I.F.T. II application within which all S.W.I.F.T. II user-to-user messages are input and output. Certain user-to-S.W.I.F.T. and S.W.I.F.T.-to user messages may also be sent and received within FIN.

Format - The rules of the layout, e.g., for a message type or field within a message type.

Format Checking - That part of S.W.I.F.T. processing which checks that a message format conforms to the message-type rules.

The checks include, among others:

- presence of mandatory fields
- absence of forbidden fields
- field length restrictions
- character restriction

- G -

GPA - see **General Purpose Application**

GPM - see **General Purpose Messages**

General Purpose Application - The SWIFT II application which establishes and controls the communication between an LT and SWIFT II. GPA also controls the initiation and termination of FIN sessions. A range of system messages may be input and output within GPA, but there are no user-to-user messages in GPA.

General Purpose Messages - One of the three categories of messages defined for the Interlinking. The GPM are messages referring to payments or any other business activities of the Interlinking. No special action is expected from the receiver of a GPM.

- H -

Header - That part of the message envelope which precedes the message text. Its prime purpose is to identify the Receiver to S.W.I.F.T. and the Sender to the Receiver. The sender and the Receiver are identified only in the header. The information contained in the header is network dependent.

- I -

ICC - see **Interlinking Communication Component**

IPC - see **Interlinking Processing Component**

IIR - see **Interlinking Internal Reference**

IL - see **Interlinking System**

Input Sequence Number - A sequential six-digit sequence number assigned to all S.W.I.F.T. II input messages.

Interlinking Communication Component - Component responsible for implementing communication processes between the network provider and the processing components.

Interlinking Processing Component - Component responsible for implementing validation and other Interlinking processes and communicate with the domestic RTGS processing component.

Interlinking System - Infrastructure and procedures which are used within each RTGS system or in addition to the RTGS systems to process cross-border payments within TARGET.

ISN - see **Input Sequence Number**.

ISO - International Organisation for Standardisation.

Integrity - Security protection aimed at ensuring that data cannot be deleted, changed, or otherwise tampered with without detection

Interlinking Internal Reference - A bilateral mechanism unique messages' referencing system within the Interlinking System.

- L -

Line Encryption - Method used to assure confidentiality of data at communication level, which means the encryption algorithms are implemented outside the application (e.g. encryption box).

Logical Terminal - The logical entity through which the users send and receive S.W.I.F.T. II messages. They correspond roughly to S.W.I.F.T. TID.

Log-in - The process by which an LT establishes a connection and opens a GPA session with the S.W.I.F.T. system. The first LOG-IN from a CBT establishes the physical connection.

Log-out - The process of terminating the logical connection between an LT and S.W.I.F.T. The last LT on a CBT to log-out also terminates the physical connection between the CBT and S.W.I.F.T.

LT - see **Logical Terminal**.

- M -

MAC - Message Authentication Code

Message - A collection of data in S.W.I.F.T. format, consisting of a header (and optionally, text and trailers) sent by a user or by S.W.I.F.T.

Message Category - A group of message types relating to a particular class of transaction, as indicated by the first digit of the MT number.

Message Input Reference - A unique reference number assigned to every input message. It consists of message input date, input LT, input session number, and ISN.

Message Output Reference - A unique reference number assigned to every output message. It consists of message output date, output LT, output session number, and OSN.

Message priority - A one-letter code, assigned by the sender of a message to indicate the priority of the message. Possible values are: S (System), U (Urgent), N (Normal).

Message Text Standard - The rules laid down for the format and content of a particular message.

Message Type - The specification of each Interlinking message by a three-digit number showing the major area (category), the function (group), and the specific details (format). There is a set of rules for each message type.

Message User Reference - A free-format field in the optional user header, allowing the sender to add his own reference of up to 16 characters.

MIR - see **Message Input Reference**.

MOR - see **Message Output Reference**.

MUR - see **Message User Reference**.

- N -

NACK - see **Negative Acknowledgement**.

Narrative - This field may contain any kind of instruction or information.

NCB - National Central Bank

Negative Acknowledgement - A negative acknowledgement, sent by the system to the sender of an input message, notifying rejection of that message. The reason for rejection is indicated by an error code. In case of a payment message, the sender remains responsible for the payment.

Non-delivery Warning - A system-generated message, warning that the message, for which the feature of delivery monitoring has been requested, was not delivered within the obsolescence period specified for that message.

Non-euro area - Collection of EU-countries which have not adopted the single currency.

Non-repudiation - A principle by which the receiver of a message cannot deny having received that message, nor the sender of having sent it.

- O -

Obsolescence Period - A period of time, expressed in units of five minutes and specified by the sending user, after which, if that message remains undelivered, a Non-Delivery warning is generated and sent to the sender.

OPC - S.W.I.F.T.'s Operating Center

Operating Dates and Times - Information exchanged in the end-of-day messages between the ECB and the other participants, in order to confirm the operational involvement of each TARGET participants for the next three business days. The times refer to the moments the participants will be ready for accepting Interlinking payments (start of day) and the final cut-off for sending Interlinking payments (end of day).

OSN - see **Output Sequence Number**.

Output Sequence Number - A sequential six-digit number assigned at each attempt to deliver a S.W.I.F.T. II output message.

- P -

Payment Settlement Message Notification - Response to a PSMN, which can be either positive or negative. In the case of a positive PSMN responsibility is passed over to the receiver, in the case of a negative PSMN the sender remains responsible for the payment.

Payment Settlement Message Request - The sender of this message is requesting the receiver to process a payment. This message requires a positive or negative response from the receiver.

PDE Trailer - Possible Duplicate Emission trailer. A user trailer, used to warn the receiver that the same message may already have been input to S.W.I.F.T.

Proprietary Message - This S.W.I.F.T. message type is used for formats defined and agreed between users, for those messages not (yet) live.

PSMN - see **Payment Settlement Message Notification**

PSMR - see **Payment Settlement Message Request**

PSTN - Public Switched Telephone Network.

- R -

RCC - see **RTGS Communication Component**

Regional Processor - The node of the SWIFTII system that is primarily responsible for input message validation and output message queues.

RP - see **Regional Processor**

RPC - see **RTGS Processing Component**

RSA - Asymmetric encryption algorithm named after its designers, Rivest, Shamir and Adleman.

RTGS system - Real-time Gross Settlement system.

RTGS Communication Component - Component within the RTGS responsible for implementing the communication process with its participants.

RTGS Processing Component - Component within the RTGS responsible for implementing the processing of the payments at the domestic level.

- S -

S.W.I.F.T. Access Point - The local node of the distributed S.W.I.F.T. II network, primarily responsible for the user's connections, input message validation, and output message queues. Physical connections are made via one of a number of CPs attached to the SAP.

S.W.I.F.T. Transport Network - The collection of S.W.I.F.T. - controlled equipment and circuits, located world-wide, which provides the user organisation with access to S.W.I.F.T. services, by facilitating the physical communication between user CBTs and S.W.I.F.T. sites.

SAP - see **S.W.I.F.T. Access Point**

SCC - see **System Control Centre**

SCP - see **System Control Processor**

SCR - see **Secure Card Reader**

Secure Card Reader - tamper-resistant card reader, incorporating a hardware security module, supplied by S.W.I.F.T. and required for Bilateral Keys Exchanges and Integrated Circuit Card management functions.

Session Number - A sequential four-digit number, used to identify a particular session and increased by one each time a new session is started. A session starts when a log-in/select message is sent and acknowledged, and closes when a log-out/quit message is sent and acknowledged.

Slice Processor - One of the large computers in the S.W.I.F.T. II network which performs the routing and safe storage of messages. Each SP is in control of a number of specific destinations.

SP - see **Slice Processor**.

STN - see **S.W.I.F.T. Transport Network**

Subfield - A data element which constitutes the smallest indivisible unit within a field constituting of more than one data element. A group of two or more subfields constitutes a field.

System Control Centre - One of the two manned sites from which the S.W.I.F.T. II system is operated and controlled.

System Control Processor - A large computer, within the S.W.I.F.T. II network, which monitors and controls the entire S.W.I.F.T. II network as well as access to that network.

System Message - A message from a user to S.W.I.F.T. or from S.W.I.F.T. to a user.

- T -

Tag - A two-digit identifier of a field, sometimes followed by a letter. It marks the presence and start of the field. A letter indicates the format option chosen for the field.

TARGET - acronym for Trans-European Automated Real-Time Gross Settlement Express Transfer System. The payment mechanism which will include the national RTGS systems and their linkages. It will process cross-border payments after the start of Stage Three.

Terminal - Any communication equipment approved by S.W.I.F.T. that is connected to a S.W.I.F.T. regional processor.

Terminal Identifier - see **Bank Identifier Code (BIC)**

Text - That part (block 4) of a S.W.I.F.T. II message which contains the substance of the message. The text format varies according to the message type in question. It is enclosed between the header and the trailer.

TID - see **Terminal Identifier**

Trailer - The part of a message envelope which follows the text. It provides the Receiver with additional information about the message. The information contained in the header are network dependent.

TRN - see **Transaction Reference Number**

Transaction Reference Number - Field 20 in all messages. The sender's unambiguous identification of the transaction. Its detailed form and content are at the discretion of the sender.

- V -

Validation - The class of check performed by the S.W.I.F.T. system upon data transmitted to ensure that it conforms to the standards laid down in the User handbook and elsewhere.

- X -

X.25 - Standardised communication protocol for the networked computers.

11. LIST OF FIGURES

FIGURE 2-1 - TECHNICAL ANNEXES TO THE TARGET REPORT.....	2
FIGURE 2-2 - MESSAGES CLASSIFICATION	3
FIGURE 2-3 - COMPONENTS AND INTERFACES	3
FIGURE 2-4 - SETTLEMENT MESSAGE FLOW	3
FIGURE 3-1 - FUNCTIONAL SPECIFICATIONS WITHIN EXISTING INFRASTRUCTURES	3
FIGURE 4-1 - TECHNICAL ANNEXES TO THE TARGET REPORT.....	3
FIGURE 4-2 - MESSAGE CLASSIFICATION	3
FIGURE 4-3 - LAYER ORIENTED DATA PRESENTATION	3
FIGURE 5-1 - COMPONENTS AND INTERFACES	3
FIGURE 5-2 - INTERLINKING PAYMENTS IN A V-SHAPED TOPOLOGY	3
FIGURE 5-3 - INTERLINKING PAYMENTS IN A Y-SHAPED TOPOLOGY VIA THE DATA COLLECTION POINT	3
FIGURE 5-4 - INTERLINKING PAYMENTS IN A Y-SHAPED TOPOLOGY VIA THE NCB.....	3
FIGURE 5-5 - INTERLINKING PAYMENTS IN AN L-SHAPED TOPOLOGY	3
FIGURE 5-6 - THE LINK OF DIFFERENT TOPOLOGIES	3
FIGURE 5-7 - LOCAL AND REMOTE RECOVERY OF DOMESTIC SYSTEMS AND THE NETWORK (EXAMPLE).....	3
FIGURE 6-1 - CROSS-BORDER PAYMENT BETWEEN CREDIT INSTITUTIONS.....	3
FIGURE 6-2 - SETTLEMENT MESSAGE FLOW.....	3
FIGURE 6-3 - END-OF-DAY CONTROL OPERATIONS	3
FIGURE 6-4 - END-OF-DAY DELAY PROCEDURES	3
FIGURE 8-1 - AVAILABILITY OF SYSTEMS AND LINK FACILITIES	3
FIGURE 8-2 - PHYSICAL SECURITY	3
FIGURE 8-3 - LOGICAL ACCESS CONTROL	3
FIGURE 8-4 - DELIVERY OF MESSAGES	3
FIGURE 8-5 - DATA CONFIDENTIALITY AND INTEGRITY	3
FIGURE 8-6 - DATA AUTHENTICATION, NON-REPUDIATION	3
FIGURE 8-7 - AUTHENTICATION KEY EXCHANGE.....	3
FIGURE 8-8 - MESSAGE AUTHENTICITY	3

CONFIDENTIAL

**EUROPEAN
MONETARY
INSTITUTE**

INTERLINKING

Data Dictionary

Provided by the

TARGET Project Team

0. RELEASE NOTES

In order to follow the current status of all chapters of this document, we provide you with the following matrix. The numbers mentioned in the column 'Rel.No.' refer to the current version of the chapter.

Chapter	Status¹	Number of pages	Date	Rel.No.
0	Final	1	26 SEP 97	1.30
1	Final	2	26 SEP 97	1.30
2	Final	4	26 SEP 97	1.30
3	Final	17	26 SEP 97	1.30
4	Final	10	26 SEP 97	1.30
5	Open	1	26 SEP 97	1.30
6	Final	7	26 SEP 97	1.30

¹ Open: the chapter is foreseen, but currently empty. No special comment is required.
Draft: the chapter has been drafted. Comments are required.
Final: the chapter has been agreed by the TTF.

1. TABLE OF CONTENTS

0. RELEASE NOTES	0-1
1. TABLE OF CONTENTS	1-1
2. FORMATTING RULES	2-1
2.1 THE INTERLINKING INTERNAL REFERENCE (IIR)	2-1
2.2 FIELDS	2-2
2.2.1 Dates	2-2
2.2.2 Time	2-2
2.2.3 Amounts	2-2
2.2.4 Currency code	2-3
2.2.5 Country Codes	2-3
2.2.6 Party identification	2-3
2.2.7 Account number	2-3
2.2.8 Miscellaneous	2-3
2.3 MESSAGES	2-4
3. MESSAGES FORMAT	3-1
3.1 MT 198 / 100 - CUSTOMER TRANSFER	3-1
3.1.1 Scope	3-1
3.1.2 General Format	3-2
3.1.3 Field Specifications	3-2
3.1.4 Rule specifications	3-2
3.2 MT 198 / 202 - GENERAL FINANCIAL INSTITUTION TRANSFER	3-4
3.2.1 Scope	3-4
3.2.2 General Format	3-5
3.2.3 Field Specifications	3-5
3.2.4 Rule specifications	3-5
3.3 MT198 SUB 110 - PAYMENT SETTLEMENT MESSAGE NOTIFICATION (PSMN)	3-6
3.3.1 Scope	3-6
3.3.2 General Format	3-6
3.3.3 Field Specifications	3-6
3.3.4 Rule specifications	3-7
3.3.5 Rejection error code	3-7
3.4 MT198 SUB 111 - THE END OF DAY CHECK MESSAGE REQUEST (ECMR)	3-8
3.4.1 Scope	3-8
3.4.2 Message format	3-8
3.4.3 Field specifications	3-8
3.4.4 Rule specifications	3-9
3.5 MT198 SUB 112 - THE END OF DAY CHECK MESSAGE NOTIFICATION (ECMN)	3-10
3.5.1 Scope	3-10
3.5.2 Message format	3-10
3.5.3 Field specifications	3-11
3.5.4 Rule specifications	3-11
3.5.5 Usage guidelines	3-12
3.6 MT198 SUB 113 - DELAY CLOSING TIME REQUEST (DCTR)	3-12
3.6.1 Scope	3-12
3.6.2 Message format	3-12
3.6.3 Field specifications	3-12
3.7 MT198 SUB 114 - DELAY CLOSING TIME NOTIFICATION (DCTN)	3-12
3.7.1 Scope	3-12
3.7.2 Message format	3-12
3.7.3 Field specifications	3-12

3.7.4 Rule specifications	3-12
3.7.5 Rejection error code	3-12
3.8 MT198 SUB 115 - INTERLINKING FREE FORMAT MESSAGE (IFFM).....	3-12
3.8.1 Scope.....	3-12
3.8.2 Message format.....	3-12
3.8.3 Field specifications.....	3-12
3.8.4 Usage guidelines.....	3-12
4. FIELDS DESCRIPTION	4-12
4.1 FIELD 12 - SUB-MESSAGE TYPE.....	4-12
4.2 FIELD 20 - TRANSACTION REFERENCE NUMBER	4-12
4.3 FIELD 21 - RELATED REFERENCE.....	4-12
4.4 FIELD 32A - VALUE DATE, CURRENCY CODE, AMOUNT	4-12
4.5 FIELD 50 - ORDERING CUSTOMER.....	4-12
4.6 FIELD 52A - ORDERING INSTITUTION.....	4-12
4.7 FIELD 56A - INTERMEDIARY	4-12
4.8 FIELD 57A - ACCOUNT WITH INSTITUTION.....	4-12
4.9 FIELD 58A - BENEFICIARY INSTITUTION.....	4-12
4.10 FIELD 59 - BENEFICIARY CUSTOMER	4-12
4.11 FIELD 70 - DETAILS OF PAYMENTS.....	4-12
4.12 FIELD 71A - DETAILS OF CHARGES.....	4-12
4.13 FIELD 72 - SENDER TO RECEIVER INFORMATION	4-12
4.14 FIELD 77E - PROPRIETARY MESSAGE	4-12
4.15 FIELD 900 - INTERLINKING INTERNAL REFERENCE	4-12
4.16 FIELD 901 - REFERRED INTERLINKING INTERNAL REFERENCE.....	4-12
4.17 FIELD 902 - HIGHEST BILATERAL IIR SENT.....	4-12
4.18 FIELD 903 - HIGHEST BILATERAL IIR RECEIVED.....	4-12
4.19 FIELD 910 - ECB DATE AND TIME OF RECEIPT	4-12
4.20 FIELD 912 - NEXT 3 BUSINESS DATE-TIME	4-12
4.21 FIELD 913 - TIME STAMP	4-12
4.22 FIELD 914 - NEW CLOSING TIME	4-12
4.23 FIELD 990 - ACCEPTANCE CODE / MATCHING STATUS	4-12
4.24 FIELD 991 - REASON CODE	4-12
4.25 FIELD 994 - COUNTERPART.....	4-12
4.26 FIELD 996 - DEBIT TURNOVER.....	4-12
4.27 FIELD 997 - CREDIT TURNOVER.....	4-12
4.28 FIELD 998 - ACTION ON BEHALF	4-12
4.29 FIELD 999 - FREE FORMAT TEXT.....	4-12
5. EXAMPLES	5-12
6. APPENDIXES.....	6-12
6.1 CONVENTIONS	6-12
6.2 CHARACTER SET.....	6-12
6.3 COUNTRY CODES	6-12
6.4 PARTICIPANTS TO THE INTERLINKING SYSTEM	6-12
6.5 APPLICATION CODES.....	6-12
6.6 ERROR CODES	6-12
6.7 LIST OF MESSAGES	6-12
6.8 FIELDS CROSS REFERENCE	6-12
6.8.1 S.W.I.F.T. fields.....	6-12
6.8.2 Non S.W.I.F.T. fields.....	6-12

2. FORMATTING RULES

2.1 THE INTERLINKING INTERNAL REFERENCE (IIR)

The IIR is an application-based, bilateral, unique and sequential reference number.

‘Application-based’ means that each application using the Interlinking will use a different numbering sequence. E.g., RTGS transactions, Accounting information, etc.

It is ‘bilateral, unique and sequential’ because it is made up of the following elements:

- an application code;
- the business date;
- the country code of the sender of the message;
- the country code of the receiver of the message;
- the sequence number for the message which is reset to ‘0’ every day and is independent for each application code and within each application code for each pair of country codes.

Rule #1

An independent numbering sequence will be created for each pair Sending NCB/ECB - Receiving NCB/ECB in each application code.

Rule #2

Each numbering sequence is reset to ‘0’ at the beginning of each business day. The first bilateral message exchanged will show 1 (or a higher number) in the sequence number.

Rule #3

A separate application code will be used for the Payment Settlement Message Requests (PSMRs), Payment Settlement Message Notifications (PSMNs), End-of-day Check Message Requests (ECMRs) and End-of-day Check Message Notifications (ECMNs)..

Rule #4

- *The sequence number for the relevant application code is increased by one for each new message (PSMR, PSMN, ECMR or ECMN).*

No IIR is assigned to General Purpose Messages (GPM) or DCTR/DCTM messages. However, within the free format text, reference can be made to a previously assigned IIR.

Rule #5

If for any reason, a duplicate of a PSMR, PSMN, ECMR or ECMN has to be sent, the message will be a copy of the original one, including the IIR.

Rule #6

The consecutiveness of the IIRs has to be checked by the sending NCB.

In the case of error detection procedures at the end of the day, the sending NCB should be able to justify gaps in IIRs detected by the receiving NCB, in particular for those messages which were generated but never sent.

Note: The ECB and the Deutsche Bundesbank share the same country code in their BIC code², i.e. DE. Therefore, any time a country code is used in isolation of a BIC code, EU will be used for the ECB and DE for the Deutsche Bundesbank. This also applies for the EMI.

2.2 FIELDS

2.2.1 Dates

Format: 6n

Dates are represented as a six digit integer in ISO form YYMMDD, where:

YY = year;
MM = month; and
DD = day.

No blank or other characters are allowed.

Within all Interlinking fields, 1997 will be the reference date. All decades greater than or equal to 97 belong to the years 1900, while all decades lower than 97 belong to the years 2000.

E.g.: 990125 = 25 Jan 1999
150125 = 25 Jan 2015

2.2.2 Time

Format: 4n or 6n

Time is represented either as a four or six digit integer in form HHMM[SS], where:

HH = hours;
MM = minutes; and
SS = seconds.

2.2.3 Amounts

- The integer part of an amount must contain at least one digit;

² ISO rejected the request to create a country code for Europe.

- A 'decimal comma' will separate the integer part and the fractional part;
- The 'decimal comma' must always be present, even if no fractional part is mentioned.
- No characters other than '0123456789,' are allowed.
- The number of digits in the fractional part must not exceed the maximum number of digits for fractions of euro, i.e. 2.

2.2.4 Currency code

Format: 3a

Only the code **EUR** is allowed.

2.2.5 Country Codes

The country code consists of two characters representing the ISO country code (see chapter 6.3).
The country code for the EMI/ECB, when not used in a BIC code, will be **EU**

2.2.6 Party identification

Format: 4a2a2b[3b]

The Interlinking will only accept the Bank Identifier Code of a financial institution. The BIC code is in the form of NNNNCCLLBBB, where:

NNNN is a code for the bank;
CC is the ISO country code;
LL is the location code; and
BBB is an optional branch code.

Refer to chapter 6.4 for a list of BIC Codes of the participants to the Interlinking system.

2.2.7 Account number

Format: [1a]/[34x] or [1a]/34x or /34x

The account number must start with a '/

2.2.8 Miscellaneous

- All code words must be in upper case.
- All fields are separated by a carriage return, line feed
- In fields containing multiple lines, each line ends with a carriage return, line feed
- All fields start with a field tag surrounded by ":".
- All dates and times must be expressed in the ECB time zone.

2.3 MESSAGES

- Fields must appear in the same order as they are described in the Data Dictionary.
- Messages may not exceed 10,000 characters, including header and footer.
- Fields which are marked with this sign may be repeated. They should appear in the same order as in the first sequence. The number of times the sequence can be repeated is unlimited, as long as the global size of the message does not exceed 10,000 characters.



3. MESSAGES FORMAT

3.1 MT 198 / 100 - CUSTOMER TRANSFER

3.1.1 Scope

This message is sent through the Interlinking by an NCB/ECB on its own behalf or at the request of a credit institution, to another NCB/ECB either on its own behalf or in favour of a credit institution.

It is used to convey a fund-transfer instruction in which the ordering customer or the final beneficiary customer, or both, are non-financial institutions.

The following guidelines apply when sending an MT198/100:

- The sending NCB/ECB should ensure that the original ordering institution is mentioned in field 52A (or the domestic equivalent). If this information is not provided by the sending institution and the sending NCB is not able to provide the information, the payment must be rejected by the sending NCB/ECB.
- The sending NCB/ECB should ensure that the bank of the beneficiary is mentioned in field 57A, and the beneficiary's account number is present in field 59. If either one of these items of information is not available, the payment should be rejected by the sending NCB/ECB.
- If field 56A is filled in, and the receiving NCB/ECB is able to identify the bank as a direct or indirect participant in its RTGS system, the payment should be forwarded to that bank or its representative/correspondent, otherwise the payment should be rejected.
- If field 56A is not present but the receiving NCB/ECB is able to identify the bank in field 57A as a direct or indirect participant in its RTGS system, the payment should be forwarded to that bank or its representative/correspondent, otherwise the payment should be rejected.
- In addition, both the sending and receiving NCB/ECB must ensure that all BIC codes are valid. The current release of the S.W.I.F.T. BIC Directory has to be taken as a reference.

3.1.2 General Format

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 100	3n
M	77E	Proprietary Message	73x [n*78x]
<hr/>			
M	900	<i>Interlinking Internal Reference</i>	<IIR>
M	913	<i>Time stamp</i>	<DT>
M	20	<i>Transaction Reference Number of Sending Credit Institution</i>	16x
M	32A	<i>Value Date</i> <i>Currency Code</i> <i>Amount</i>	6n 3a 15n
M	50	<i>Ordering Customer</i>	4*35x
M	52A	<i>Ordering Institution</i>	<BIC>
O	56A	<i>Intermediary</i>	[/1a][/34x] <BIC>
M	57A	<i>Account With Institution</i>	[/1a][/34x] <BIC>
M	59	<i>Beneficiary Customer</i>	/34x 4*35x
O	70	<i>Details of Payments</i>	4*35x
O	71A	<i>Details of Charges</i>	3a
O	72	<i>Sender to Receiver Information</i>	6*35x

3.1.3 Field Specifications

field 900 - IIR

Sending NCB's IIR to which the PSMN must refer.

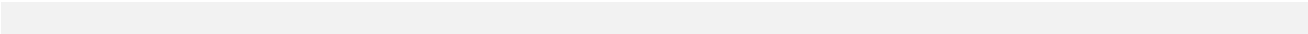
field 913 - Time stamp

The time stamp refers to the time that the debiting of the sending credit institution has taken place in the RTGS system of the sending NCB/ECB. It is adjusted to the time zone of the ECB.

For additional information, refer to 'chapter 4- FIELDS DESCRIPTION' and 'S.W.I.F.T. User Handbook, Standards 1 - GENERAL INFORMATION' and 'S.W.I.F.T. User Handbook, Standards 2- PAYMENT, CASH MANAGEMENT and CUSTOMER STATUS'.

3.1.4 Rule specifications

1. Either field 50 (ordering Customer) or field 59 (Beneficiary Customer) must be a non-financial institution.
2. Field 52A, optional for S.W.I.F.T., is mandatory for the Interlinking. If the information is not provided by the sending institution and the sending NCB is not able to provide the information, the sending NCB/ECB should reject the payment order.
3. Field 57A, optional for S.W.I.F.T., is mandatory for the Interlinking. If this field is missing, the sending NCB/ECB should reject the payment order.

4. If the first field containing a bank's identifier (see scope of the message) cannot be used to identify an (in)direct participant in the receiving RTGS system, the receiving NCB/ECB must reject the PSMR. The negative acknowledgement will show the appropriate error code.
- 

3.2 MT 198 / 202 - GENERAL FINANCIAL INSTITUTION TRANSFER**3.2.1 Scope**

This message is sent through the Interlinking by an NCB/ECB on its own behalf or at the request of a credit institution, to another NCB/ECB either on its own behalf or in favour of a credit institution.

It is used to order the movement of funds between financial institutions or NCBs/ECB via the Interlinking.

The following guidelines apply when sending an MT198 sub 202:

- The sending NCB/ECB should ensure that the original ordering institution is mentioned in field 52A (or the domestic equivalent). If this information is not provided by the sending institution and the sending NCB is not able to provide the information, the payment must be rejected by the sending NCB/ECB.
- All parties to the transaction must be financial institutions.
- If field 56A is filled in, field 57A must be present too.
- If field 56A is filled in, and the receiving NCB/ECB is able to identify the bank as a direct or indirect participant in its RTGS system, the payment should be forwarded to that bank or its representative/correspondent, otherwise the payment should be rejected.
- If field 56A is not present, but field 57A is filled in, and the receiving NCB/ECB is able to identify the bank in field 57A as a direct or indirect participant in its RTGS system, the payment should be forwarded to that bank or its representative/correspondent, otherwise the payment should be rejected.
- If neither field 56A nor field 57A are present, and the receiving NCB/ECB is able to identify the bank in field 58A as a direct or indirect participant in its RTGS system, the payment should be forwarded to that bank or its representative/correspondent, otherwise the payment should be rejected.
- In addition, both the sending and receiving NCB/ECB must ensure that all BIC codes are valid. The current release of the S.W.I.F.T. BIC Directory has to be taken as a reference.
- For an inter-NCB-payment the non-TARGET BIC code of the receiving NCB has to be put into field 58A of the message. In field 72 the codeword "INTERNCB" (between slashes ('/')) has to be mentioned.

3.2.2 General Format

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 202	3n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>900</i>	<i>Interlinking Internal Reference</i>	<i><IIR></i>
<i>M</i>	<i>913</i>	<i>Time stamp</i>	<i><DT></i>
<i>M</i>	<i>20</i>	<i>Transaction Reference Number of Sending Credit Institution</i>	<i>16x</i>
<i>M</i>	<i>21</i>	<i>Related Reference</i>	<i>16x</i>
<i>M</i>	<i>32A</i>	<i>Value Date</i> <i>Currency Code</i> <i>Amount</i>	<i>6n</i> <i>3a</i> <i>15n</i>
<i>M</i>	<i>52A</i>	<i>Ordering Institution</i>	<i><BIC></i>
<i>O</i>	<i>56A</i>	<i>Intermediary</i>	<i>[/1a][/34x]</i> <i><BIC></i>
<i>O</i>	<i>57A</i>	<i>Account With Institution</i>	<i>[/1a][/34x]</i> <i><BIC></i>
<i>M</i>	<i>58A</i>	<i>Beneficiary Institution</i>	<i>[/1a][/34x]</i> <i><BIC></i>
<i>O</i>	<i>72</i>	<i>Sender to receiver information</i>	<i>6*35x</i>

3.2.3 Field Specifications

field 900 - IIR

Sending NCB's IIR to which the PSMN must refer.

Field 913 - Time stamp

The time stamp refers to the time that the debiting of the sending credit institution has taken place in the RTGS system of the sending NCB/ECB. It is adjusted to the time zone of the ECB.

For additional information, refer to 'chapter 4- FIELDS DESCRIPTION' and 'S.W.I.F.T. User Handbook, Standards 1 - GENERAL INFORMATION' and 'S.W.I.F.T. User Handbook, Standards 2- PAYMENT, CASH MANAGEMENT and CUSTOMER STATUS'.

3.2.4 Rule specifications

1. All parties to the transaction must be financial institutions.
2. Field 52A, optional for S.W.I.F.T., is made mandatory for the Interlinking. If the information is not provided by the sending institution and the sending NCB is not able to provide the information, the sending NCB/ECB should reject the payment order.
3. If the first field containing a bank's identifier (see scope of the message) cannot be used to identify an (in)direct participant in the receiving RTGS system, the receiving NCB/ECB must reject the PSMR. The negative acknowledgement will show the appropriate error code.

3.3 MT198 SUB 110 - PAYMENT SETTLEMENT MESSAGE NOTIFICATION (PSMN)

3.3.1 Scope

This is the response to a Payment Settlement Message Request. This message can be either a positive or a negative acknowledgement. A positive acknowledgement indicates that the receiving NCB/ECB of the PSMR has successfully credited the payment. If the acknowledgement is negative, the message will include the reason for not executing the payment by using an appropriate code word.

As long as the sending NCB has not received the relative PSMN, the payment remains its responsibility.

A negative PSMN is also returned to the sending NCB/ECB in the case of receipt of a message whose message sub-type is not supported or not recognisable.

3.3.2 General Format

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 110	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>900</i>	<i>Interlinking Internal Reference</i>	<i><IIR></i>
<i>M</i>	<i>913</i>	<i>Time stamp</i>	<i><DT></i>
<i>M</i>	<i>901</i>	<i>Referred Interlinking Internal Reference</i>	<i><IIR></i>
<i>M</i>	<i>910</i>	<i>ECB date and time of receipt</i>	<i><DT></i>
<i>M</i>	<i>990</i>	<i>Acceptance code</i>	<i><u>1</u>n</i> <i>accepted = 0, rejected = 1</i>
<i>O</i>	<i>991</i>	<i>reason code for rejection</i>	<i><u>1a</u>2n</i>
<i>O</i>	<i>72</i>	<i>Sender to receiver information</i>	<i>6*35x</i>

3.3.3 Field Specifications

field 900 - IIR

Sending NCB's IIR.

Field 913 - Time stamp

The time stamp refers to the time that the crediting of the receiving credit institution has taken place in the RTGS system of the receiving NCB/ECB or the time for the creation of the message in the case of syntax validation error. It is adjusted to the time zone of the ECB.

Field 901 - Referred Interlinking Internal Reference

The IIR of the PSMR to which the current acknowledgement refers must be mentioned in field 901. It contains an exact copy of the field :900: given in the message it refers to.

If the PSMN has been generated as a reaction to an unknown message sub-type or no field :900: could be identified, the field :901: should contain the codeword UNKNOWN.

Field 910 - ECB date and time of receipt

Local date and time of the receipt of the relevant PSMR adjusted to the ECB time zone.

Field 990 - Acceptance code

'0' if the PSMR is positively acknowledged, '1' if the PSMR is negatively acknowledged.

Field 991 - Reason code for rejection

This field is mandatory when the PSMR has been rejected. It should contain a code explaining the reason for the rejection of the PSMR. If a 'x00' code (undefined error code) is shown, field 72 becomes mandatory.

Field 72 - Sender to receiver information

This optional field may contain information explaining the reason of the rejection. It becomes mandatory if the code in field 991 is 'x00' (undefined reason code).

For additional information, refer to '*chapter 4- FIELDS DESCRIPTION*' and '*S.W.I.F.T. User Handbook, Standards 1 - GENERAL INFORMATION*' and '*S.W.I.F.T. User Handbook, Standards 2- PAYMENT, CASH MANAGEMENT and CUSTOMER STATUS*'.

3.3.4 Rule specifications.

- Field 991 is mandatory if field 990, acceptance code, is '1' (rejected).
- Field 72 should not be used when the code in field 991 is not 'x00'.

3.3.5 Rejection error code.

Depending on the reason for the negative acknowledgement, field 991 will have one of the values as set out in chapter 6.6.

3.4 MT198 SUB 111 - THE END OF DAY CHECK MESSAGE REQUEST (ECMR)

3.4.1 Scope

This message is sent to the ECB by an NCB that wants to initiate its End-of-day Control Procedures, or by NCBs which are aware that other NCBs want to initiate these procedures. The message will contain information concerning the PSMRs exchanged during the current business day with other NCBs and the ECB.

It also includes the next three business dates and times of the sending NCB.

3.4.2 Message format.

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 111	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>900</i>	<i>Interlinking Internal Reference</i>	<i><IIR></i>
<i>M</i>	<i>913</i>	<i>Time stamp</i>	<i><DT></i>
<i>M</i>	<i>998</i>	<i>Action on behalf</i>	<i><u>1</u>n 0 - closing NCB 1 - non-closing NCB</i>
<i>M</i>	<i>994</i>	<i>Counterpart</i>	<i><CC></i>
<i>M</i>	<i>902</i>	<i>Highest bilateral IIR sent</i>	<i><IIR></i>
<i>M</i>	<i>903</i>	<i>Highest bilateral IIR received</i>	<i><IIR></i>
<i>M</i>	<i>996</i>	<i>Debit Turnover</i>	<i><CC><CC>18n</i>
<i>M</i>	<i>997</i>	<i>Credit Turnover</i>	<i><CC><CC>18n</i>
<i>M</i>	<i>912</i>	<i>Next 3 business dates-times</i>	<i><DTT> <DTT> <DTT></i>



3.4.3 Field specifications

field 900 - IIR

Sending NCB's IIR to which the ECMN must refer.

Field 913 - Time stamp

The time stamp refers to the time the ECMR was created. It is adjusted to the time zone of the ECB.

Field 998 - Action on behalf

If the sending NCB/ECB wants to initiate its own End of Day Control Procedures, '0' is used, otherwise '1' is used.

Field 902 - Highest bilateral IIR sent

Only IIR's for application code A are reported.

Field 903 - Highest bilateral IIR received

Only IIR's for application code A are reported.

For additional information, refer to '*chapter 4- FIELDS DESCRIPTION*' and '*S.W.I.F.T. User Handbook, Standards 1 - GENERAL INFORMATION*' and '*S.W.I.F.T. User Handbook, Standards 2- PAYMENT, CASH MANAGEMENT and CUSTOMER STATUS*'.

3.4.4 Rule specifications

1. Only highest IIRs and turnovers for application code A, i.e. PSMRs, are transmitted in the ECMR.
 2. If needed, the sequence containing fields 994, 902,903, 996 and 997 may be repeated.
 3. If an NCB was closed due to Bank Holiday, no bilateral information is available and reported for that NCB.
 4. If no messages have been exchanged between two NCBs/ECB, the sequence numbers in both IIRs, the debit and the credit turnover will show a null amount.
 5. If the dates and times in field 912 do not match with those recorded in the database of the End-of-Day Application, a negative ECMN is returned, containing only a Syntax Error Block as well as the relevant error code. The NCB should then send a new ECMR with corrected data.
-

3.5 MT198 SUB 112 - THE END OF DAY CHECK MESSAGE NOTIFICATION(ECMN)

3.5.1 Scope

This message is sent by the ECB to the NCBs to notify them of the result of the End-of-day Control Procedures, to report on any syntax validation error(s) in the ECMR or to inform that the business dates and times included in the ECMR do not match those held by the ECB.

Depending on the way the ECB organises its matching procedure, the ECMN may contain result information for one or several NCBs/ECB.

It includes also the next three business dates and times for each NCB. These dates supersede any other dates exchanged previously.

3.5.2 Message format.

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending ECB	16x
M	12	Sub-Message Type 112	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
M	900	<i>Interlinking Internal Reference</i>	<IIR>
M	913	<i>Time stamp</i>	<DT>
M	901	<i>Referred Interlinking Internal Reference</i>	<IIR>
Syntax Error block			
M	990	<i>Acceptance code</i>	'1'
M	991	<i>reason code for rejection</i>	<u>1a</u> 2n
O	72	<i>Sender to receiver information</i>	6*35x
Successful block			
M	990	<i>Matching status</i>	<u>1</u> n 0 - successful
M	994	<i>Counterparty</i>	<CC>
M	902	<i>Highest bilateral IIR sent</i>	<IIR>
M	903	<i>Highest bilateral IIR received</i>	<IIR>
M	996	<i>Debit Turnover</i>	<CC><CC>18n
M	997	<i>Credit Turnover</i>	<CC><CC>18n
M	912	<i>Next 3 business dates-times</i>	<DTT> <DTT> <DTT>
Unsuccessful block			
M	990	<i>Matching status</i>	<u>1</u> n 1 - unsuccessful
M	994	<i>Counterparty</i>	<CC>
M	902	<i>Highest bilateral IIR sent</i>	<IIR>
M	903	<i>Highest bilateral IIR received</i>	<IIR>
M	996	<i>Debit Turnover</i>	<CC><CC>18n
M	997	<i>Credit Turnover</i>	<CC><CC>18n
M	912	<i>Next 3 business dates-times</i>	<DTT> <DTT> <DTT>

3.5.3 Field specifications.

field 900 - IIR

ECB's IIR.

Field 913 - Time stamp

The time stamp refers to the time the ECMN was created.

Field 901 - Referred Interlinking Internal Reference

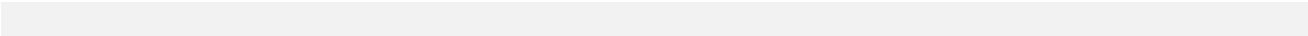
The IIR of the ECMR to which the current acknowledgement refers must be mentioned in field 901.

For additional information, refer to '*chapter 4- FIELDS DESCRIPTION*' and '*S.W.I.F.T. User Handbook, Standards 1 - GENERAL INFORMATION*' and '*S.W.I.F.T. User Handbook, Standards 2- PAYMENT, CASH MANAGEMENT and CUSTOMER STATUS*'.

3.5.4 Rule specifications

1. Syntax Error Block can only be used to report a validation error. In that case, field 990 in that block can only have the value "1" and field 991 is then mandatory.
2. In Syntax Error Block, field 72 is mandatory if the code in field 991 is 'x00'.
3. If Syntax Error Block is present, neither successful nor unsuccessful block can be part of the ECMN.
4. If Syntax Error Block is not used, either successful or unsuccessful or both blocks must be present.
5. Fields which are marked as mandatory, are only mandatory within the block to which they belong.
6. Fields 994, 902, 903, 996, 997 and 912, in the 'Unsuccessful block', contain counterparty information. They are provided to allow each NCB/ECB to compare them with their own figures and help identify problems. The ECB will exchange data received in the ECMR in fields 902 and 903, and fields 996 and 997, i.e. the data in field 902 of the ECMN sent to NCB A is taken from field 903 of the ECMR received from NCB B.
7. Within an (un)successful block, the sequence of fields 994, 902, 903, 996, 997 and 912 can be repeated.
8. Data in field 912 replaces any other data received previously.
9. An ECMN will also be returned with a syntax error block in the case that i) duplicate bilateral figures are reported; ii) figures are reported for NCBs on holiday; iii) an ECMR is received from an NCB which is supposed to be on holiday; and iv) business dates and time information do not match with the data in the End-of-day application. In the first two cases, the country code of the related counterparty will be listed in the field 72.

3.5.5 Usage guidelines

- Upon receipt of an ECMN containing an 'Unsuccessful block', the receiving NCBs/ECB must initiate Error Detection Procedures.
- 

3.6 MT198 SUB 113 - DELAY CLOSING TIME REQUEST (DCTR)

3.6.1 Scope

This message is sent by an NCB/ECB facing end-of-day closing problems to all other (still operating) NCBs and the ECB to request them to delay the start of the End-of-day procedures. NCBs/ECB are requested, if possible, to leave their system running, so that they are able to receive and process any further messages. A Delay Closing Time Notification (DCTN) reply must be sent to this message.

3.6.2 Message format.

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 113	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>20</i>	<i>Sender reference</i>	<i>16x</i>
<i>M</i>	<i>913</i>	<i>Time stamp</i>	<i><DT></i>
<i>M</i>	<i>914</i>	<i>New closing time</i>	<i><DT></i>
<i>M</i>	<i>991</i>	<i>Reason code</i>	<i><u>1a</u>2n</i>
<i>O</i>	<i>72</i>	<i>Sender to receiver information</i>	<i>6*35x</i>

3.6.3 Field specifications.

Field 20 - Sender Reference

Reference of the sending NCB to which the DCTN must refer.

Field 913 - Time stamp

The time stamp refers to the time the DCTR was created. It is adjusted to the time zone of the ECB.

Field 914 - New closing time

Contains the new proposed closing time for the requesting NCB.

Field 991 - Reason code

A reason code describing the reason of the delay must be sent. If no appropriate reason code is available, the code 'x00' (undefined reason) must be used.

Field 72 - Sender to receiver information

This optional field may contain information explaining the reason for the delay. It becomes mandatory if the code in field 991 is 'x00' (undefined reason).

For additional information, refer to '*chapter 4- FIELDS DESCRIPTION*' and '*S.W.I.F.T. User Handbook, Standards 1 - GENERAL INFORMATION*' and '*S.W.I.F.T. User Handbook, Standards 2- PAYMENT, CASH MANAGEMENT and CUSTOMER STATUS*'.

3.7 MT198 SUB 114 - DELAY CLOSING TIME NOTIFICATION (DCTN)

3.7.1 Scope

This message is the answer to a Delay Closing Time Request (DCTR). It can be either a positive or a negative acknowledgement. A positive acknowledgement implies that the receiver agrees with the new closing time. If the notification is negative, the returned error code should state the reason for not agreeing to the request. As with any other notification, this message should be received by the requesting NCB within 30 minutes of the despatch of the DCTR.

3.7.2 Message format.

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 114	<u>3</u> n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>20</i>	<i>Sender reference</i>	<i>16x</i>
<i>M</i>	<i>21</i>	<i>Related reference</i>	<i>16x</i>
<i>M</i>	<i>913</i>	<i>Time stamp</i>	<i><DT></i>
<i>M</i>	<i>910</i>	<i>ECB date and time of receipt</i>	<i><DT></i>
<i>M</i>	<i>990</i>	<i>Acceptance code</i>	<i><u>1</u>n</i> <i>accepted = 0, rejected = 1</i>
<i>O</i>	<i>991</i>	<i>Reason code for rejection</i>	<i><u>1a</u>2n</i>
<i>O</i>	<i>72</i>	<i>Sender to receiver information</i>	<i>6*35x</i>

3.7.3 Field specifications**Field 20 - Sender Reference**

Reference number of the sending NCB.

Field 21 - Related reference

Reference of the DCTR to which the present notification is referring.

Field 913 - Time stamp

The time stamp refers to the time the DCTN was created. It is adjusted to the time zone of the ECB.

Field 910 - ECB date and time of receipt

Local date and time of the receipt of the relative DCTR adjusted to the ECB time zone.

Field 990 - Acceptance code

'0' if the syntax of the DCTR is correct, '1' if the DCTR contained syntax error or if the receiver cannot comply with the extended operating hours.

Field 991 - Reason code for rejection

If field 990 is set to '1', field 991 becomes mandatory, and a code describing the error is provided. If no appropriate reason code is available, the code 'x00' code (undefined error) should be used.

Field 72 - Sender to receiver information

This optional field may contain information to describe the error reported. It becomes mandatory if the code in field 991 is 'x00' (undefined reason).

For additional information, refer to '*chapter 4- FIELDS DESCRIPTION*' and '*S.W.I.F.T. User Handbook, Standards 1 - GENERAL INFORMATION*' and '*S.W.I.F.T. User Handbook, Standards 2- PAYMENT, CASH MANAGEMENT and CUSTOMER STATUS*'.

3.7.4 Rule specifications

- Field 991 is mandatory if field 990 is '1'.
- Field 72 is mandatory when the code in field 991 is 'x00'.

3.7.5 Rejection error code

Depending on the errors, field 991: will have one of the values as set out in chapter 6.6

3.8 MT198 SUB 115 - INTERLINKING FREE FORMAT MESSAGE (IFFM)

3.8.1 Scope

This message is used to carry any kind of data or information which is not covered in §3.1 - 3.7. It may be used e.g. by the ECB to warn a participant that end of day information is missing.

The content of the message is not standardised and therefore cannot be handled automatically.

3.8.2 Message format

M/O	Field Tag	Field Name	Interlinking Format
M	20	Transaction Reference Number of Sending NCB	16x
M	12	Sub-Message Type 115	3n
M	77E	Proprietary Message	73x [n*78x]
<i>M</i>	<i>20</i>	<i>Sender reference</i>	<i>16x</i>
<i>M</i>	<i>21</i>	<i>Related reference</i>	<i>16x</i>
<i>M</i>	<i>999</i>	<i>Free Format Text</i>	<i>73x</i> <i>[n*78x]</i>

3.8.3 Field specifications

Field 20 - Sender reference

Sending NCB's reference.

Field 21 - Related reference

If the current message refers to a previously received message, the content of field 20 of that message is copied here. Otherwise, it contains the code "NEW".

Field 999 - Free Format Text

The number of lines is unlimited, as long as the total size of the message does not exceed 10,000 characters.

For additional information, refer to '*chapter 4- FIELDS DESCRIPTION*' and '*S.W.I.F.T. User Handbook, Standards 1 - GENERAL INFORMATION*' and '*S.W.I.F.T. User Handbook, Standards 2- PAYMENT, CASH MANAGEMENT and CUSTOMER STATUS*'.

3.8.4 Usage guidelines


- This message is provided to carry information between NCBs/ECB that does not fall into any other message type.
- The number of lines the field 77E can hold is linked to the length of the message. Its total length cannot exceed 10,000 characters.

4. FIELDS DESCRIPTION


4.1 FIELD 12 - SUB-MESSAGE TYPE

Definition:	The identification of a message type.
Format:	<u>3</u> n
Validations:	€The value can only be 100, 110, 111, 112, 113, 114, 115 or 202
See message(s)	100, 110, 111, 112, 113, 114, 115, 202

4.2 FIELD 20 - TRANSACTION REFERENCE NUMBER

Definition:	The sender's unambiguous identifier for the transaction.
Format:	16x
Usage guidelines:	 Different messages may have the same TRN if they refer to the same transaction. The receiver must quote the TRN for all queries to the sender. <ul style="list-style-type: none">• In a MT198 message, the TRN is the internal reference of the sending NCB. It will be referred to as the NCB TRN.• In messages MT198/100 and 202, the TRN contained in field 77E of the envelope is the one that was contained in the original payment order sent by a credit institution on behalf of a customer or on its own behalf. It will be referred as the CUSTOMER TRN. Investigations between credit institutions may need this information so it should be forwarded without alteration.• In messages MT198/113, 114 and 115, the TRN contained in field 77E of the envelope is that of the sender of the message.
Validations:	€Cannot start or finish with '/'. €Cannot contain '/'.
See message(s):	100, 110, 111, 112, 113, 114, 115, 202
See Also:	Field 900 - Interlinking Internal Reference

4.3 FIELD 21 - RELATED REFERENCE

Definition:	The identification of a transaction to which the current transaction is related.
Format:	16x
Usage guidelines:	 In a chain of messages, this is the linking reference that is usually sent forward.
Validations:	€ See ' <i>Field 20 - Transaction Reference Number</i> '
See message(s)	202, 114, 115

See Also: Field 901 - Referred Interlinking Internal Reference

4.4 FIELD 32A - VALUE DATE, CURRENCY CODE, AMOUNT

Definition: Value date, currency code and amount of transaction.

Format: 6n date (YYMMDD)
3a currency code
 15n amount

Validations: €Currency code EUR only.
 €Value date must be the same as the business date processed by TARGET.

See message(s) 100, 202

4.5 FIELD 50 - ORDERING CUSTOMER

Definition: The ordering customer of the transaction.

Format: 4*35X name and address


See message(s) 100

4.6 FIELD 52A - ORDERING INSTITUTION

Definition: The financial institution, or branch thereof, initiating the transaction on behalf of itself or the Ordering Customer (field 50).

Format: 4a2a2b[3b] - see § and §6.1 *Conventions*

Validations: €Field 52A cannot contain an account number.

Usage guidelines:  The information contained in this field must be provided by the sending credit institution. However, if needed, the sending NCB could also decide to fill it in with the BIC of the sending credit institution.

See message(s) 100, 202

4.7 FIELD 56A - INTERMEDIARY

Definition: The intermediary financial institution (between the receiving NCB and the Account With Institution), through which the transaction must pass. The Intermediary may be a branch or affiliate of the Account With Institution or of the Beneficiary Institution, or it may be an entirely different financial institution.

Format: [/1a][/34x]
4a2a2b[3b] - see § 2.2.6 Party identification and § 6.1 *Conventions*

Validations: €If used, field 56A must contain the BIC code of a participating bank in the receiving RTGS.
 €If used in an MT198/202, field 57A must be present too.

See message(s) 100, 202

4.8 FIELD 57A - ACCOUNT WITH INSTITUTION

Definition: The financial institution where the Ordering Party requests the Beneficiary to be paid. The Account With Institution may be a branch or affiliate of the Intermediary, or of the Beneficiary Institution, or it may be an entirely different financial institution.

Format: [/1a][/34x]
4a2a2b[3b] - see § 2.2.6 Party identification and § 6.1 Conventions

Validations: €Field 57A is mandatory in message type 198/100.
 €If used, and no field 56A is present, field 57A must contain the BIC code of an (in)direct participating bank in the receiving RTGS.

See message(s) 100, 202

4.9 FIELD 58A - BENEFICIARY INSTITUTION

Definition: The financial institution designated by the Ordering Institution party as the ultimate recipient of the funds. The beneficiary Institution may be a branch or affiliate of the Intermediary, or of the Account With Institution, or it may be an entirely different financial institution.

Format: [/1a][/34x]
4a2a2b[3b] - see § 2.2.6 Party identification and § 6.1 Conventions

Validations: €If field 57A is not present, field 58A must contain the BIC code of an (in)direct participating bank in the receiving RTGS.

See message(s) 202

4.10 FIELD 59 - BENEFICIARY CUSTOMER

Definition: The party designated by the Ordering Party as the ultimate recipient of the funds. The party may be a private person, a financial institution or any other organisation.

Format: /34x Account number line
 4*35x Name and address


Validations: €The account number of the beneficiary is mandatory.

See message(s) 100

4.11 FIELD 70 - DETAILS OF PAYMENTS

Definition: Information, from the Ordering Party to the Beneficiary Customer, about the reason for the payment.

Format: 4*35x

Usage guidelines:  see §2.1, 'The Interlinking Internal Reference (IIR)'

See message(s) 100, 110, 111, 112, 202


4.16 FIELD 901 - REFERRED INTERLINKING INTERNAL REFERENCE


Definition: The Interlinking reference of the related message.

Format: 16x in the form: AYYMMDDC₁C₁C₂C₂NNNNN

where:

A	application code
YYMMDD	business date
C₁C₁	country code of the sender of the message
C₂C₂	country code of the receiver of the message
NNNNN	bilateral sequence number

Usage guidelines:  Each time a message refers to a previously transmitted message, it has to provide its IIR

 see §2.1, 'The Interlinking Internal Reference (IIR)'

See message(s) 110, 112

4.17 FIELD 902 - HIGHEST BILATERAL IIR SENT

Definition: The highest Interlinking Internal Reference Number sent.

Format: 16x in the form: AYYMMDDC₁C₁C₂C₂NNNNN

where:

A	application code
YYMMDD	business date
C₁C₁	country code of the sender
C₂C₂	country code of the receiver
NNNNN	bilateral sequence number

Usage guidelines:  Only highest IIR from application code 'A' (PSMRs) is reported.

See message(s) 111, 112

4.18 FIELD 903 - HIGHEST BILATERAL IIR RECEIVED

Definition: The highest Interlinking Internal Reference Number received.

Format: 16x in the form: AYYMMDDC₁C₁C₂C₂NNNNN

where:

A	application code
YYMMDD	business date
C₁C₁	country code of the sender
C₂C₂	country code of the receiver
NNNNN	bilateral sequence number

Usage guidelines:  Only highest IIR from application code 'A' (PSMRs) is reported.

See message(s) 111, 112

4.19 FIELD 910 - ECB DATE AND TIME OF RECEIPT

Definition: Date and time the related message was received.

Format: 10n in the form YYMMDDHHMM
where:

YYMMDD is the date
HHMM is the time.

Usage guidelines:  The date and time must be expressed in the time zone of the ECB.



See message(s) 110, , 114

4.20 FIELD 912 - NEXT 3 BUSINESS DATE-TIME

Definition: Operating date and time for the next three business days.

Format: 3*14n in the form YYMMDDH₁H₁M₁M₁H₂H₂M₂M₂
YYMMDDH₁H₁M₁M₁H₂H₂M₂M₂
YYMMDDH₁H₁M₁M₁H₂H₂M₂M₂
where

YYMMDD is the date
H₁H₁M₁M₁ is the opening time
H₂H₂M₂M₂ is the closing time

Usage guidelines:  The dates and times must be expressed in the time zone of the ECB.
 Each line is separated by a Carriage Return Line-feed.



See message(s) 111, 112

4.21 FIELD 913 - TIME STAMP

Definition: 1) The time the debiting of the sending credit institution has taken place in the RTGS system of the sending NCB; or
2) The time the crediting of the receiving credit institution has taken place in the RTGS system of the receiving NCB; or
3) The date and time the message was created.

Format: 12n in the form YYMMDDHHMMSS
where:

YYMMDD is the date
HHMMSS is the time.

Usage guidelines:  This field is provided for tracing purposes only.
 The date and time must be expressed in the time zone of the ECB.

See message(s) definition 1: 100, 202
 definition 2: 110 (if a positive PSMN)
 definition 3: 110 (if a negative PSMN), 111, 112, 113, 114


4.22 FIELD 914 - NEW CLOSING TIME

Definition: New closing time proposed by the sending NCB/the ECB.

Format: 10n in the form YYMMDDHHMM
 where:

YYMMDD is the date

HHMM is the time.

Usage guidelines:  The date and time must be expressed in the time zone of the ECB.

See message(s) 113

4.23 FIELD 990 - ACCEPTANCE CODE / MATCHING STATUS


Definition: Code indicating whether the related message was accepted (i.e. successfully processed) or rejected (i.e. unsuccessfully processed).


Format: 1n

where possible options are:

0 accepted / successful

1 rejected / unsuccessful.

Usage guidelines:  In case of rejection, error detection procedures must be initiated immediately.


 In case the value in field 990 is '1', the field 991 must be used.


See message(s) 110, 112, 114

4.24 FIELD 991 - REASON CODE

Definition: Code giving the reason for a rejected message, or an unsuccessful processing.

Format: 1a2n

Usage guidelines:  Codes are grouped into different categories. The appropriate code should be used to describe the situation.

 If no code is adequate, code x00 (where x represent the error category) should be used. In that case, field 72 (providing the receiver with details about the error) becomes mandatory.

See message(s) 110, 112, 113, 114

4.25 FIELD 994 - COUNTERPART

Definition: Country code of the counterparty NCB/ECB.

Format: 2a in the form CC
where

CC country code

See message(s) 111, 112

4.26 FIELD 996 - DEBIT TURNOVER

Definition: The sum of all the positively acknowledged debits entries at the close of the business day.



Format: 2a 2a 18n

where:

2a is the country code of the account holder;

2a is the country code of the account serviced;

18n is the unsigned total.

Usage guidelines:  A null debit turnover must also be reported.
 Only debit turnover generated by PSMRs is reported.

Example: :996:BEDE12345678,52 : DE has a debit turnover of 12345678,52 in BE's book.

See message(s) 111, 112

4.27 FIELD 997 - CREDIT TURNOVER

Definition: The sum of all the positively acknowledged credits at the close of the business day.



Format: 2a 2a 18n

where:

2a is the country code of the account holder;

2a is the country code of the account serviced;

18n is the unsigned total.

Usage guidelines:  A null credit turnover must also be reported.
 Only credit turnover generated by PSMRs is reported.

Example: :997:BEDE12345678,52 : DE has a credit turnover of 12345678,52 in BE's book.

See message(s) 111, 112

4.28 FIELD 998 - ACTION ON BEHALF

Definition: A code to specify whether the ECMR has been sent by a closing NCB/the ECB, or by an NCB/the ECB which stays open..

Format: 1n

where possible options are:


- 0 the sending NCB/ECB initiates its End of Day Control Operations
- 1 the sending NCB/ECB stays open but other NCBs are closing.

See message(s) 111

4.29 FIELD 999 - FREE FORMAT TEXT

Definition: Any free text must comply with the semantic rules of the Interlinking system.

Format: 73x
[n*78x]

Usage guidelines:  The total length of this field must be such that the message does not exceed 10.000 characters.

See message(s) 115

5. EXAMPLES

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6. APPENDIXES

6.1 CONVENTIONS

In the fields description, the following conventions will apply:

M	Mandatory.
O	Optional.
a	alphabetical character (A through Z). Upper case only (e.g., Field currency code, code words, ...).
n	digit only (0 through 9).
b	alphabetic characters and digits.
x	any kind of characters (restricted to the character set).
␣	space.
[]	optional.
nn	maximum length.
nn-nn	range.
<u>nn</u>	fixed length.
nn*nn	maximum of number of lines times max. Line length.
<BIC>	4a2a2b[3b]
<CC>	Country code of the counterpart.
<DT>	Date and Time in the format: YYMMDDHHMM[SS]
<DTT>	Date, starting time and ending time in the format: YYMMDDHHMMHHMM
<IIR>	Interlinking Internal Reference in the format: AYYMMDDC ₁ C ₁ C ₂ C ₂ NNNNN

where:

A	application code
YYMMDD	is the date of the transaction
C₁C₁	country code of the sender
C₂C₂	country code of the receiver
NNNNN	bilateral sequence number

<time> time in the format HHMM

<Field A> Format is **[/1a][/34x]⁷** Account number line
4a2a2b[3b] ISO Bank Identifier Code

Account numbers.

Format is: **[/1a][/34x]** where

subfield 1 may be /C if Receiver's account with the Sender is credited
/D if Sender's account with the Receiver is debited.

Subfield 2 is the account number information preceded by a '/'

⁷ Field 52A cannot contain an account number



The field(s) beside that sign may be repeated.

6.2 CHARACTER SET

The character set of Interlinking contain the following characters:

```
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
/ - ? : ( ) . , ' + { }
<Carriage Return Line Feed> Space
```

Note: the '{' and '}' are used as separator by S.W.I.F.T.. Therefore, they cannot be used in the text body.

6.3 COUNTRY CODES

The following table gives an overview of the country codes used in the Interlinking system:

Country	ISO code	Country	ISO code
Austria	AT	Greece	GR
Belgium	BE	Ireland	IE
Denmark	DK	Italy	IT
Germany	DE	Luxembourg	LU
Spain	ES	The Netherlands	NL
Finland	FI	Portugal	PT
France	FR	Sweden	SE
United Kingdom	GB	<i>ECB/EMI</i>	EU ⁸

⁸ The country code EU must be used for the ECB/EMI except in their BIC address.

6.4 PARTICIPANTS TO THE INTERLINKING SYSTEM

The following table gives the list of the BIC codes authorised in the Interlinking system⁹:

Country	BIC code	Country	BIC code
Austria	NABAATTG	Greece	BNGRGRTG
Belgium	NBBEBETG	Ireland	IRCEIETG
Denmark	DKNBDKTG	Italy	BITAITTG
Germany	MARKDETG	Luxembourg	IMLULUTG
Spain	ESPBESTG	The Netherlands	FLORNLTG
Finland	SPFBFITG	Portugal	BGALPTTG
France	BDFEFRTG	Sweden	RIKSSETG
United Kingdom	BKENGBTG	<i>ECB</i>	???
		<i>EMI</i>	EMIFDETG

6.5 APPLICATION CODES

The following table lists the different applications (and their codes) authorised in the Interlinking system:

Applications	Codes
PSMR	A
PSMN	B
ECMR	C
ECMN	D

⁹ The table will be amended when ECB has registered a new BIC for the TARGET closed user group.

6.6 ERROR CODES

Rejection Code	Signification	Rejection Code	Signification
Content related codes		Format related codes	
T00	Unknown error	F00	Unknown error
T01	Invalid date	F01	Field not supported (here)
T02	Invalid BIC code	F02	Field option not supported
T03	Invalid currency code	F03	Fields out of sequence
T04	Invalid sequence of character(s)	F04	Message type not supported
T05	Invalid combination of country codes	F05	Invalid amount format
T06	Unknown RTGS participant	F06	Invalid account number format
T07	Account number missing	F07	Line(s) too long
T08	Sender of ECMR on holiday	F08	Too many lines
T09	Sequence number error	F09	Field format error
T10	Invalid code word	F10	Invalid date format
T11	Invalid combination of amount and sequence number	F11	Invalid time format
T12	Invalid application code	F12	Unexpected data
T13	Invalid country code	F13	- not used -
T14	Business dates and times do not match	F14	Block is missing
T15	Invalid time	F15	Field is missing
T16	Counterparty on holiday-	Misc. Error codes	
T17	Invalid code	M00	Unknown error
T18	Invalid reason code	M01	Message received too late
T19	Duplicate information in ECMR	Delayed Messages related codes	
Security Error codes		D00	Unknown error
S00	Unknown error	D01	Domestic RTGS is down
		D02	Delay too long

6.7 LIST OF MESSAGES

Message sub-type	Description
100	Customer Transfer
202	General Financial Institution Transfer
110	Payment Settlement Message Notification
111	End of Day Check Message Request
112	End of Day Check Message Notification
113	Delay Closing Time Request
114	Delay Closing Time Notification
115	Interlinking Free Format Message

6.8 FIELDS CROSS REFERENCE

6.8.1 S.W.I.F.T. fields

Fields	Description	Messages
12	Sub-Message Type	100, 110, 111, 112, 113, 114, 115, 202
20	Transaction Reference Number	100, 110, 111, 112, 113, 114, 115, 202
21	Related Reference	114, 115, 202
32A	Value Date, Currency Code, Amount	100, 202
50	Ordering Customer	100
52A	Ordering Institution	100, 202
56A	Intermediary	100, 202
57A	Account With Institution	100, 202
58A	Beneficiary Institution	202
59	Beneficiary Customer	100
70	Details of Payments	100
71A	Details of Charges	100
72	Sender to Receiver Information	100, 110, 112, 113, 114, 202
77E	Proprietary Message	100, 110, 111, 112, 113, 114, 115, 202

6.8.2 Non S.W.I.F.T. fields

Fields	Description	Messages
900	Interlinking Internal Reference	100, 110, 111, 112, 202
901	Referred Interlinking Internal Reference	110, 112
902	Highest Interlinking Internal Reference sent	111, 112
903	Highest Interlinking Internal Reference received	111, 112
910	ECB date and time of Receipt	110, 114
912	Next 3 business dates-times	111, 112
913	Time Stamp	100, 110, 111, 112, 113, 114, 202
914	New closing time	113
990	Acceptance code / Matching status	110, 112, 114
991	reason code	110, 112, 113, 114
994	Counterpart	111, 112
996	Debit Turnover	111, 112
997	Credit Turnover	111, 112
998	Action on behalf	111
999	Free Format Text	115

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**EUROPEAN
MONETARY
INSTITUTE**

**MINIMUM COMMON PERFORMANCE FEATURES OF RTGS-
SYSTEMS WITHIN TARGET**

-
- The structure of the TARGET system
 - Legal and contractual basis for RTGS systems
 - The business functions of RTGS systems
 - Reliability of RTGS systems
 - Responsibility and auditability
-

Provided by the

0. RELEASE NOTES

In order to follow the current status of all chapters of this document, we provide you with the following matrix. The numbers mentioned in the column 'Rel.No.' refer to the current version of the chapter.

Chapter	Status¹	Number of pages	Date	Rel.No.
0	Final	1	26 SEP 97	1.30
1	Final	2	26 SEP 97	1.30
2	Final	1	26 SEP 97	1.30
3	Final	1	26 SEP 97	1.30
4	Final	1	26 SEP 97	1.30
5	Final	7	26 SEP 97	1.30
6	Final	2	26 SEP 97	1.30
7	Final	1	26 SEP 97	1.30

¹ Open: the chapter is foreseen, but currently empty. No special comment is required.
Draft: the chapter has been drafted. Comments are required.
Final: the chapter has been agreed by the TTF.

1. TABLE OF CONTENTS

0. RELEASE NOTES 1

1. TABLE OF CONTENTS 1

2. INTRODUCTION 1

3. THE STRUCTURE OF THE TARGET SYSTEM 1

3.1 THE TARGET COMPONENTS 1

3.2 ELEMENTS OF NATIONAL RTGS SYSTEMS 1

 3.2.1 Core element..... 1

 3.2.2 Supporting elements..... 1

4. LEGAL AND CONTRACTUAL BASIS FOR RTGS SYSTEMS 1

4.1 ACHIEVEMENT OF IRREVOCABLE AND UNCONDITIONAL SETTLEMENT 1

4.2 CLARIFICATION OF RESPONSIBILITIES OF DIFFERENT ENTITIES 1

5. THE BUSINESS FUNCTIONS OF RTGS SYSTEMS 1

5.1 PAYMENT SYSTEM RELATED FUNCTIONS..... 1

 5.1.1 Operating hours and national holidays..... 1

 5.1.2 Pricing policies..... 1

 5.1.3 Minimum amount..... 2

 5.1.4 Queuing facilities..... 2

5.2 ACCOUNTING FUNCTIONS (INTERLINKING USER REQUIREMENTS §3.2.2, 3.2.6) 2

5.3 PROVISION OF INTRADAY LIQUIDITY 2

5.4 COMMUNICATION FUNCTIONS OF RTGS SYSTEMS 3

5.5 PROCESSING AND TRANSMISSION TIME 3

5.6 END-OF-DAY PROCEDURES DURING A NORMAL BUSINESS DAY 3

 5.6.1 Cut-off time for customer payments..... 3

 5.6.2 Cut-off time for interbank payments 4

 5.6.3 End-of-day control procedures in national RTGS systems..... 5

 5.6.4 Reimbursement of intra-day liquidity and finalisation of account balances 5

5.7 END-OF-DAY PROCEDURES DURING ABNORMAL SITUATIONS 5

 5.7.1 Abnormal situations..... 5

 5.7.2 Hold back of payments on the sending side..... 5

 5.7.3 Processing of late customer and interbank payments received from or credited on the accounts of RTGS participants..... 5

 5.7.4 Finalisation of the business day 6

5.8 END-OF-DAY PROCEDURES DURING A DISASTER BUSINESS DAY 6

 5.8.1 Disaster situation..... 6

 5.8.2 Stop processing of payments on the sending side..... 6

 5.8.3 Enforced closing procedure..... 7

 5.8.4 Finalisation of the business day 7

5.9 CURRENCY CONVERSION 7

5.10 AUDIT TRAIL..... 7

5.11 ARCHIVING 7

6. RELIABILITY OF RTGS SYSTEMS..... 1

6.1 RTGS SYSTEMS AND TARGET 1

6.2 AVAILABILITY AS A BASIS FOR A RELIABLE RTGS SYSTEMS (INTERLINKING USER REQUIREMENTS §3.6) 1

6.3 SECURITY OF RTGS SYSTEMS..... 1

 6.3.1 Integrity and authenticity (Interlinking User Requirements §3.7.2)..... 1

 6.3.2 Non-repudiation (Interlinking User Requirements §3.7.2)..... 2

 6.3.3 Confidentiality (Interlinking User Requirements §3.7.3) 2

2. Introduction

Because the “Minimum performance features of the Interlinking” have already been defined in the Interlinking User Requirements, this paper mainly covers “Minimum common features of RTGS systems within TARGET”. Together, both papers should define the “Minimum common performance features of TARGET as a whole”.

3. The structure of the TARGET system

3.1 The TARGET components

The TARGET system is defined as a payment system composed of one RTGS system in each of the countries which participate in Stage Three of EMU and the ECB payment mechanism. RTGS systems of non-participating countries may also be connected, provided that they are able to process the single currency alongside the national currency. The RTGS systems and the ECB payment mechanism are interconnected according to common procedures (“Interlinking”) to allow payment orders to move from one system to another (Interlinking User Requirements §2.1).

3.2 Elements of national RTGS systems

3.2.1 Core element

National RTGS systems, as expressed in the TARGET Report (1995 and 1996), are gross settlement systems in which each transaction is processed and settled in real time. This means that settlement takes place before the advice is passed to the transferee. In this framework, the settlement is immediately irrevocable and unconditional. An irrevocable and unconditional transfer effects a discharge of the obligation to make the transfer (Interlinking User Requirements §3.2.1).

3.2.2 Supporting elements

The core RTGS function has to be supported by a legal and contractual basis, business functions and technical functions.

Legal and contractual basis:

- the legal basis for irrevocable and unconditional settlements has to be provided by national law;
- in addition, the responsibilities of all entities involved, whether as participants in or service providers for the system, should be clearly defined and confirmed by contract.

Accounting functions (Interlinking User Requirements §3.3):

- stable accounting framework (to provide final settlement);
- audit trail and archiving (to comply with bookkeeping requirements).

Business functions (Interlinking User Requirements §3.2, §3.5.3):

- clear design of message flow (to define how and when payment/settlement information is transmitted);
- clear definition of the status of payment orders and the notification schemes.

Technical equipment:

- availability of systems and communication links (to allow real-time processing and timely finalisation of settlement) (Interlinking User Requirements §3.6);
- security (integrity, authenticity, non-repudiation, confidentiality) of systems and links to ensure the correct functioning of the system (Interlinking User Requirements §3.7).

4. Legal and contractual basis for RTGS systems

4.1 Achievement of irrevocable and unconditional settlement

Payments within RTGS systems are not to be credited to the beneficiary's account before being irrevocably debited² from the originator's account. Cross-border payments are to be sent through the Interlinking system only when their amount has been irrevocably debited from the originator's account.

NCBs, and the EMI on behalf of the ECB, have to contribute to the development of a sound legal basis for their systems. This matter will have to be elaborated by payment system experts in co-operation with legal experts.

4.2 Clarification of responsibilities of different entities

Clarification will have to be elaborated by payment system experts in co-operation with legal experts.

² Equivalent methods such as the blocking of funds could be applied.

5. The business functions of RTGS systems³

5.1 Payment system related functions

5.1.1 Operating hours and national holidays

TARGET will have long operating hours. As a general rule, it will open at 7 a.m. and close at 6 p.m. ECB time. However, domestic RTGS systems may open at an earlier time for processing domestic payments only. One hour before the aforementioned closing time, participants in RTGS systems (in both euro area and non-euro area countries) will stop processing customers' payments in euro.

This harmonisation, based on the current longest operating hours in the EU, will allow for a large overlap between TARGET and the payment systems of the major financial centres in North America and the Far East, thereby supporting the efforts made by credit institutions and central banks world-wide to limit cross-currency settlement risks. A common closing time may be seen as a means to obviate the risk of substantial payments taking place outside the common operating hours and will therefore prevent the occurrence of "regional"/segmented movements in interest rates affecting the conduct of the single monetary policy, which call for an identical level of interest rates throughout the euro area.

The options for operating/closing RTGS systems on national holidays are still under discussion.

5.1.2 Pricing policies

The pricing policies of NCBs, for payment system functions, aim at avoiding competitive distortions in the context of the Single Market and EMU. Within this framework, the TARGET pricing policy is directed at cost recovery while complying with the main requirements: it should not hinder the integration of the money market and thus affect the implementation of the single monetary policy; it should maintain a level playing-field between participants; and it should contribute to risk reduction policies in payment systems.

The recovery of central bank costs involved in TARGET will enable the ESCB i) to avoid the inappropriate use of economic resources; ii) to allocate costs, whenever possible, to the appropriate source; and iii) to avoid unfair competition between central banks' and other payment arrangements.

In order to prepare a pricing policy based on cost recovery, the TARGET Task Force is currently developing a common calculation method for payment processing costs. From a monetary policy point of view, attention is being paid to the possible effects of price differentials on market arbitrage, i.e. the impact of transactions costs on effective interest yields. Overly high transaction charges or excessive price differentials would discourage interest rate arbitrage and threaten the singleness of the ECB's monetary policy in Stage Three.

Moreover, the TARGET pricing policy has to be compatible with EU competition law and avoid a situation in which overly wide price differentials affect the level playing-field between credit institutions.

³ All times mentioned in this report should be seen as parameters which might change in the future based e.g. on operational experience.

Finally, the TARGET pricing policy must not induce institutions to use less secure payment mechanisms.

5.1.3 Minimum amount

According to the TARGET Report, an initial minimum payment amount may have to be introduced for technical reasons, e.g. for limiting the volume of messages. However, there will be no obligation for the first instructed central bank to check whether the minimum payment amount has been observed.

5.1.4 Queuing facilities

Some RTGS systems will offer their customers queuing and queue-matching facilities, in some cases combined with queue transparency. However, this issue is left to central banks. No common solution is envisaged (in particular, no consolidation of payments pending in different queues).

5.2 Accounting functions (Interlinking User Requirements §3.2.2, 3.2.6)

RTGS payments will be settled via accounts held with national central banks. Settlement at NCBs will take place in real time.

Accounting information will be a domestic feature. No new cash management facility will be offered to credit institutions which have several accounts within TARGET (because they are direct participants in several RTGS systems).⁴ In particular, there will be no provision for real-time consolidation of accounts.

5.3 Provision of intraday liquidity

In principle, the technical and functioning rules should be identical for RTGS systems of euro countries participating in TARGET, or RTGS systems of non euro countries connected to it⁵.

In particular, intraday credit may be provided either by granting participants in RTGS systems the possibility of overdrawing their account with the central bank during the day, and/or by using intraday repurchase agreements. Moreover, intraday credit to all participants in RTGS systems needs to be fully collateralised according to the rules to be adopted by the ECB Governing Council in the context of common monetary policy.

The ECB Governing Council will decide whether intraday credit may be granted by the ESCB to NCBs of countries not yet participating in the Monetary Union. Following a decision made by the EMI Council in December 1996, three mechanisms are being prepared which aim at preventing intraday credit, if granted to non-euro area NCBs, from spilling over into overnight credit. A final decision on which mechanism(s) to implement will be taken by the Governing Council of the ECB.

The mechanisms are:

- mechanism 1: high penalty rates on spillovers (supplemented by non-pecuniary sanctions) and early cut-off time for customer payments, in euro and non-euro countries.⁶

⁴ The facilities which are (or will be) offered by some domestic RTGS systems to their participants are not affected by this decision.

⁵ These common rules concern the RTGS systems of non-euro countries only when they process euros.

- mechanism 2: limits (possibly set at zero) for intraday credit granted by euro NCBs to non-euro NCBs, with control by each non-euro NCBs of its consolidated exposure to the euro area;
- mechanism 3: earlier cut-off time for non-euro TARGET participants (NCBs and credit institutions).

For mechanism three, the EMI Council agreed that the earlier cut-off time will not apply to the processing of payments by the non-euro NCBs, but rather to the use of intraday credit in euro by them. This implies that the cut-off time for processing payments will be the same for euro and non-euro participants but that, from a certain time on, non-euro NCBs would be allowed to issue further payment instructions to euro NCBs only if they have a positive balance in euro vis-à-vis the euro zone as a whole. The time at which this deadline is to be set will be decided by the ECB, if the ECB Governing Council decides to implement this mechanism.

This way of implementing mechanism 3 would be advantageous for both euro and non-euro participants: euro participants would not have to consider separate timetables for sending payments to non-euro participants and the latter would be able to process payments until 6 p.m., provided that sufficient funds are available. Moreover, this mechanism would facilitate the distribution of liquidity in euro between participants in TARGET, by avoiding that funds remaining unused in accounts located in non-euro countries. This proposal would not have any negative impact on the conduct of the monetary policy; on the contrary, it could contribute to the smooth functioning of the money market in euro.

5.4 Communication functions of RTGS systems

All RTGS systems will transmit settlement and business information between sending and receiving credit institutions in real time. However, within TARGET, for domestic communication, central banks can retain or develop their own communication infrastructure (V-shape, Y-shape or L-shape).

5.5 Processing and transmission time

The processing and transmission time from one RTGS system to another RTGS system is defined as the sum of the time required in both the sending and the receiving systems, including the communication between the two systems (i.e. the time required by the RTGS system and the domestic Interlinking component - each system has a maximum of 7.5 minutes - plus the time needed for the transmission of the data between national Interlinking components). Under normal circumstances, the transmission time for the Interlinking network will be less than ten seconds for 99% of the traffic, and less than fifteen minutes for the remainder. The maximum total time is defined as thirty minutes (this definition covers the period from the debiting of the account of the ordering bank by the sending RTGS system until the crediting of the account of the beneficiary bank at the receiving NCB, and includes the transmission time).

5.6 End-of-day procedures during a normal business day

5.6.1 Cut-off time for customer payments

RTGS systems stop accepting customer payments at 17.00. This cut-off time is valid for both domestic and cross-border customer payments. Customer payments are defined as payment

⁶ The early cut-off for customer payments applies whether either of the other mechanisms is chosen.

messages in the MT100 format, or equivalent national message format (which would use the MT100 to be transmitted cross-border).

The implementation of the 17.00 cut-off for domestic customer payments is to be decided by each NCB in co-operation with its banking community. NCBs can continue to process domestic customer payments which were in a queue at 17.00.

As far as cross-border payments are concerned, each NCB will choose one of the following options⁷⁸:

- NCBs reject customer payments which are presented to them after 17.00;
- the RTGS system rejects all customer payments which would be debited after 17.00;
- NCBs which can only recognise customer payments at the level of the Interlinking components re-credit and reject all customer payments which have been debited after 17.00;
- systems ensure, in an automated way, that cross border customer payments are not presented to the interface of the Interlinking network after 17.07.30.

After the cut-off time new customer payments are rejected in accordance with whichever of the above principle is chosen. Cross-border customer payments queued are cancelled after 17:07:30.

Cross-border customer payments debited by the sending NCB are processed without any further hurdle (i.e. no automatic control of timely sending is provided on the side of receiving NCBs). Credit institutions receiving third party payments after the cut-off time are obliged to accept them.

5.6.2 Cut-off time for interbank payments

On normal operating days the “external closing of TARGET”, i.e. the closing time for all national RTGS systems participating in (or connected to) TARGET is 18.00. No further payments are accepted for processing after the closing time, unless a delayed closing time procedure has been approved.

At the closing time, RTGS systems no longer accept any new payment orders for processing. Payments which are presented after 18.00 are rejected. Domestic interbank payments which are in a queue at 18.00 could still be processed, because funds received through the Interlinking after the closing time might release them. The last attempt to process domestic payments in a queue has to take place immediately after the Interlinking component has been allowed to close by the ECB:

- before 18.00, payments are processed if funds or overdrafts are available; otherwise they are queued or rejected depending on the features of the RTGS system;
- at 18.00, NCB stop accepting new payment orders ;
- after 18.00, only payments accepted before 18.00 are debited. In principle, cross-border payments should be presented to the CBT before 18:07:30 and, in any case, cross-border payments in a queue are cancelled at the latter time at the latest. Depending on local circumstances, domestic interbank payment orders which were already in a queue at 18.00 may still be debited if and when funds or overdraft facilities become available.

⁷ NCBs will report their choice to the EMI in due time.

⁸ If the choice is made among one of the first three options an ex-post control will be made by the NCBs to verify that payments were not presented to the CBT after 17:07:30.

In principle all payments debited in one NCB need to be credited same day in another NCB. Payment orders received at 18.00 should be sent through the Interlinking by 18.07.30 at the latest.⁹

5.6.3 End-of-day control procedures in national RTGS systems

End of day control procedures in national RTGS systems (concerning domestic activity) are conducted according to domestic rules. The daily Interlinking activity needs to be successfully finalised before these domestic control procedures can be considered finalised.

5.6.4 Reimbursement of intra-day liquidity and finalisation of account balances

The timely reimbursement of intra-day liquidity provided by an NCB to RTGS participants by means of collateralised intraday overdrafts or intraday repos has to be monitored in some way. If intraday liquidity is provided by means of intraday repos, a procedure needs to be in place to check (within or outside the RTGS) that intraday repos entered into during the day are reversed (i.e the intra-day loan is reimbursed) before the closing time of the RTGS system. The framework under which intra-day overdrafts or intra-day repos are reimbursed is to be determined by each NCB.

Account balances of direct RTGS participants are definite only after successful finalisation of all end-of-day control procedures made by NCBs and the ECB (i.e. after it has been controlled that no further funds are to be debited or credited in the RTGS accounts).

5.7 End-of-day procedures during abnormal situations

5.7.1 Abnormal situations

For RTGS systems all those situations are abnormal which cause serious delays during the day and/or for the end-of-day procedures during a normal business day. Within this framework all situations are covered which can be resolved until 20.00.

5.7.2 Hold back of payments on the sending side

Once one NCB is in a contingency situation and the ECB has asked the other NCBs to stop sending further payments to the NCB with difficulties, the other NCBs should, as soon as possible, stop sending any new payments addressed to the former.

In case payments are nevertheless sent by RTGS participants (or have been sent before the information is disseminated), NCBs should either reject the payments or queue them before debiting them. As much as possible, NCBs should avoid blocking payments after they have been debited (in order to avoid withdrawing liquidity from the banking sector).

5.7.3 Processing of late customer and interbank payments received from or credited on the accounts of RTGS participants

The cut-off time for customer payments may be postponed (beyond the 17.00 deadline) in exceptional circumstances only. In that case, cross-border customer payments can be sent “in

⁹ presented to the CBT

both directions” between the NCBs/the ECB. Furthermore, NCBs or the ECB need to allow new (critical) interbank payments to be received and debited after the TARGET 18.00 closing time and, as a result, request all other NCBs to postpone their closing time. Regarding those NCBs/the ECB that did not ask for the delay, the NCBs whose RTGS system has a queuing mechanism do not accept new payments after the 18.00 closing time (if not otherwise agreed between the ECB and NCBs) while NCBs whose RTGS system does not provide for queuing may accept that payments that have already been rejected are re-entered to the RTGS system¹⁰.

The way how late payments are managed technically in the RTGS systems is left to the NCBs/the ECB. NCBs/the ECB may e.g. decide either to keep an “individual channel” to one credit institution open or to allow all credit institutions to make payments. Furthermore it is a national feature how to inform credit institutions about incoming payments after the regular closing of the system.

5.7.4 Finalisation of the business day

NCBs’/the ECB’s system have to be capable to conduct end-of-day control procedures in national RTGS systems, reimbursement of intra-day liquidity and finalisation of account balances resulting from payment activities after having completed the payment processing at 20.00 at the latest.

5.8 End-of-day procedures during a disaster business day

5.8.1 Disaster situation

A disaster situation is defined as a situation when the payments processing capability of a NCB/the ECB has disappeared as a result of, for example, a fire or an explosion, and it is not possible to foresee when the payments processing system is operational again and where it is expected that the system will not be again up and running before 20.00. Furthermore, a technical problem that has already postponed the closing time until 20.00 without being resolved may also be declared, by the ECB, to be handled as a disaster situation.

5.8.2 Stop processing of payments on the sending side

If a NCB/the ECB receives information on a disaster situation it is obliged to immediately stop debiting cross-border payment orders addressed to the NCB/ECB experiencing a disaster situation. Any payment, sent to the NCB/ECB experiencing the disaster situation, not acknowledged within 30 minutes, provided that the sending NCB is able to ensure that it has not already been received by the receiving side, should be cancelled and re-credited in the account of the sending credit institution, unless it is foreseen that a recovery will take place within a reasonable time. The settlement (crediting) of all payments debited and sent through the Interlinking by the NCB experiencing the disaster should be finalised (if possible, i.e. no error in message) by the receiving NCBs.

¹⁰ This arrangement is based on the assumption that, in RTGS systems without queuing facilities, some payments might have been rejected while, if they had been made through an RTGS system providing for queuing, they would have been placed in the queue. As a result, it is considered that payments might be re-entered to the RTGS systems without queuing facilities. In a delayed closing time procedure, payments pending in a queue at 18.00 can be debited until the new closing time.

5.8.3 Enforced closing procedure

If the ECB declares a situation to be regarded as a disaster situation, then the enforced closing procedure should be immediately activated.

Payments pending in TARGET when the enforced closing procedure is initiated have to be credited by receiving NCBs or re-credited and rejected by sending NCBs according to a bilateral agreement to be established between each pair of NCBs involved. RTGS systems have to be prepared for re-crediting of payments which have been sent earlier.

5.8.4 Finalisation of the business day

NCBs/the ECB which are not in a contingency situation have to complete the business day as described under 5.6.4.

5.9 Currency conversion

The national RTGS systems have to be able to provide the Interlinking with payments denominated in euro only, regardless of the currency that may be used in the domestic RTGS system.

5.10 Audit trail

Auditability means that it would be possible to identify whether:

- individual payment messages clearly meet the agreed detailed specification for the format and content of messages sent through the Interlinking system;
- there is an adequate audit trail of the operational system to enable an independent assessment to be made regarding the accuracy and timeliness of payment messages passing through the system, and the extent to which other defined performance parameters of the system are being met.

5.11 Archiving

Data processed via RTGS systems have to be archived in compliance with national rules and based on a TARGET contract. The nature and content of such a contract have to be clarified with legal and accounting experts.

6. Reliability of RTGS systems

6.1 RTGS systems and TARGET

RTGS systems are composed of a telecommunication infrastructure and RTGS processing equipment in the central banks. In addition, in the TARGET context, RTGS systems have to provide (as a separate component or within the system itself) features for inter-NCB/ECB payment transfers. The domestic equipment in front of the S.W.I.F.T. telecommunication network¹¹ that links the central banks is seen as the NCBs'/ECB's own equipment for RTGS/Interlinking purposes in TARGET.

The statement in the Interlinking User Requirements reads as follows:

“Because the NCBs, and the EMI on behalf of the ECB, are free to implement Interlinking application functions within domestic RTGS systems or in a separate module, the Interlinking user requirements do not provide a definition of availability criteria for domestic Interlinking components.”

Hence, this paper deals with this matter from the viewpoint of “national (RTGS) functionality in front of the S.W.I.F.T. network”.

6.2 Availability as a basis for a reliable RTGS systems (Interlinking User Requirements §3.6)

For RTGS systems, availability is seen as the key factor of reliability. The Interlinking User Requirements state the following for TARGET as a whole and in this context also for RTGS systems that:

“TARGET as a whole has to provide facilities capable of completing the business day in a final and irrevocable position before the start of the next one (before the opening time of domestic RTGS systems on the next business day), and to provide a sufficient infrastructure to conduct the next business day.”

To increase the reliability of the TARGET system further, it may be advisable to define a maximum time-span for intraday unavailability of RTGS systems. This should be clarified in the further steps of the project.

6.3 Security of RTGS systems

6.3.1 Integrity and authenticity (Interlinking User Requirements §3.7.2)

The methods applied will have to provide features to prevent any threat to the integrity and authentication of the data during communication, processing and storage. These methods must be designed in such a way that they will not be compromised or compromisable in the foreseeable future. They will have to be implemented and monitored in such a way that will ensure their proper use.

¹¹ The provisional network for the Interlinking system.

6.3.2 Non-repudiation (Interlinking User Requirements §3.7.2)

Given the fact that RTGS systems operate in a reliable environment (banks and NCBs/the ECB are seen as trustworthy partners), non-repudiation should be seen as advisable but not indispensable for RTGS systems at the start of Stage Three.

6.3.3 Confidentiality (Interlinking User Requirements §3.7.3)

Confidentiality can be seen as an important service for RTGS system users, but has no impact on availability. Without any doubt, data should remain confidential during processing and storage on systems or long-term storage media. Ideally, data should be transported in an encrypted form.

However, at present, banking communities (and their customers) in EU countries have very different views on the risks of a loss of confidentiality during telecommunication via public or private networks. Some encrypt data during RTGS system communications, others transmit plain text (without any known case of any loss of confidentiality). A short-term agreement and implementation on the “encryption of data during national RTGS system communication” seems to be impossible. Against this background, the following would appear to be adequate:

“In order to be as open as possible for TARGET users, details of which NCBs encrypt and which NCBs do not encrypt domestically should be made public. However, evaluating the current trends in the telecommunications and payment systems market, NCBs that do not provide encryption features domestically at present should move to encryption at a later stage.

7. Responsibility for and auditability of minimum common performance features

Each NCB, and the EMI on behalf of the ECB, is responsible for the compliance of its systems as explained in this paper on “Minimum Common Performance Features of RTGS systems within TARGET”.

The NCBs’ and the EMI’s auditors, on behalf of the ECB, are responsible for auditing the system. They may wish to agree on common audit procedures or even common audit groups for the examination of RTGS systems within TARGET.