



EUROPEAN CENTRAL BANK



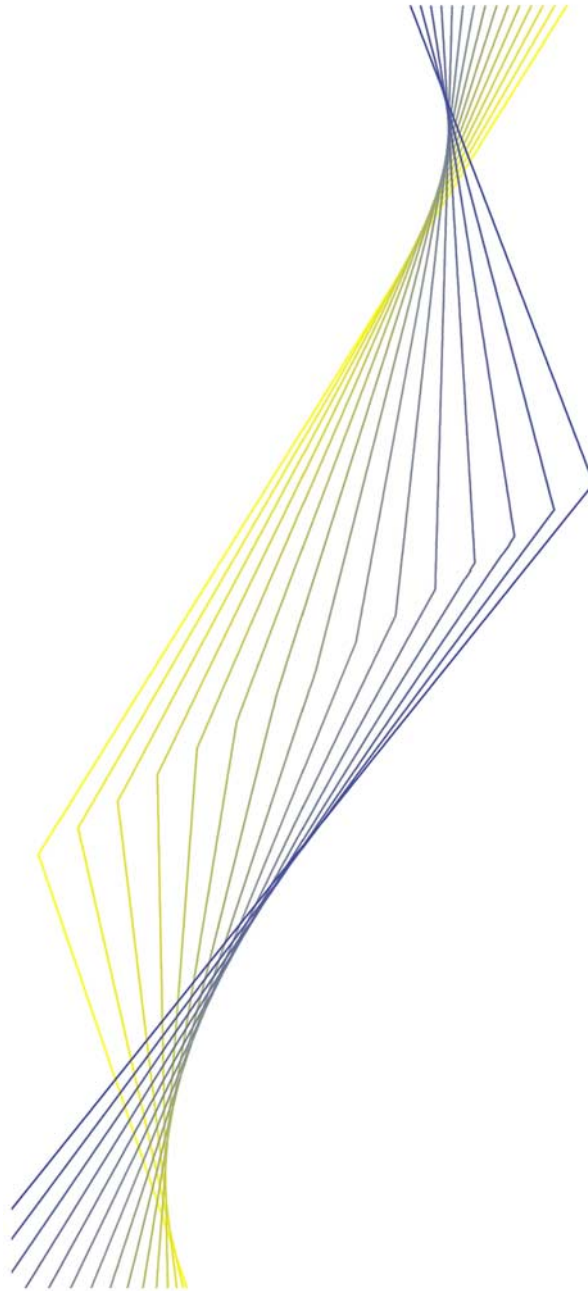
# **TARGET INTERLINKING USER REQUIREMENTS**

**November 2001 edition**

**June 2002**



EUROPEAN CENTRAL BANK



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INTERLINKING  
USER REQUIREMENTS**

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# INTERLINKING USER REQUIREMENTS

## 1. THE INTERLINKING SYSTEM AND GUIDELINES FOR ITS DEVELOPMENT

### 1.1 TARGET and the Interlinking system

The Trans-European Automated Real-time Gross settlement Express Transfer (TARGET) system is a payment system composed of one real-time gross settlement (RTGS) system in each of the countries participating in Economic and Monetary Union (EMU), and the European Central Bank (ECB) payment mechanism. RTGS systems in non-EMU countries which were existing Member States of the European Union (EU) already at the start of stage III., may also be connected, provided that they are able to process the euro alongside their national currency. The RTGS systems and the ECB payment mechanism are interconnected by means of common procedures (known as the “Interlinking” system) which allow payment orders to move from one system to another.

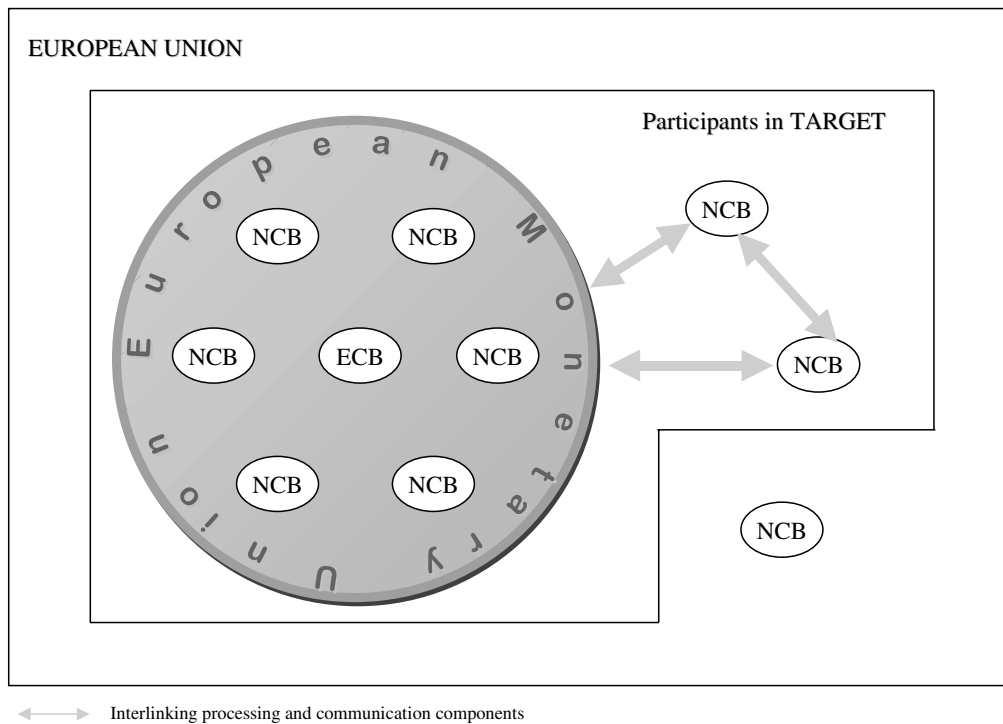


Figure 1-1 - TARGET

The specifications for individual RTGS systems and their implementation are the responsibility of the national central banks (NCBs). The provision of the ECB payment mechanism (EPM) is the task of the ECB.

Designing the functions needed for EU-wide interconnection and monitoring (the analytical phase) is a task to be carried out jointly by the ECB and EU NCBs. Implementing the individual functions can be done under separate responsibility either by integrating them with the RTGS systems and the ECB payment mechanism, or by implementing some or all functions in a separate subsystem.

## **1.2 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 use a common set of payment system and accounting functions as well as functions for settlement between NCBs.

## **1.3 The definition of the Interlinking system**

The Interlinking system comprises a set of processing functions at each NCB and the ECB:<sup>1</sup>

- payment system-related functions;
- accounting system-related functions;
- communication functions between the Interlinking components;
- functions to ensure availability and security;
- interface functions to the domestic RTGS systems and the ECB payment mechanism.

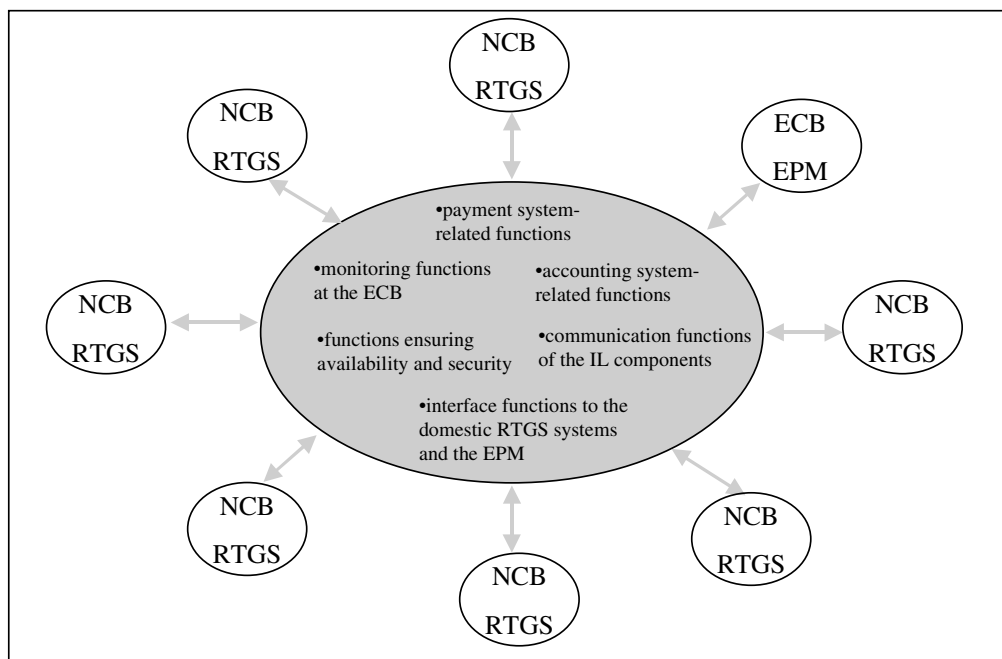
The Interlinking handles payments in euro only, regardless of the currencies used in the domestic RTGS systems.<sup>2</sup>

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<sup>1</sup> 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 set out in this document.

<sup>2</sup> Participating RTGS systems still using national currency must provide a conversion feature to allow payments to be handled in the Interlinking.

## The Interlinking system



NCB RTGS - national central bank RTGS system that participates in the European System of Central Banks

EPM - ECB payment mechanism  
 ↔ - Interlinking processing and communication components  
 IL - Interlinking

Figure 1-2 - The Interlinking system

### 1.4 Strategy for the design and implementation of the Interlinking system

The design should ensure that it is possible to add new central banks and/or new facilities without complicating the system or introducing new systemic risks. Therefore the interface between the different systems involved should be well defined and follow agreed (international) standards as far as possible. The following minimum guidelines should be adhered to:

- The exchange of payments should be message-oriented (item by item);
- The data exchange within the Interlinking should be based on SWIFT formats.



## **2. THE USER REQUIREMENTS FOLLOWING THE DIFFERENT FUNCTIONS OF THE INTERLINKING SYSTEM**

### **2.1 General remarks concerning application system-oriented functions**

For analytical reasons (not as a guideline for implementation), the payment system-related functions and the accounting functions are 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 that the User Requirements for this logical system are defined independently of those for the “physical” infrastructure at each NCB and the ECB.

This approach allows the user requirements for application systems to be defined independently of those for the existing IT and payment systems infrastructure at the different NCBs and at the ECB. It also makes these requirements easier to view and gives the NCBs and the ECB a high level of flexibility with regard to implementation.

### **2.2 The payment system-related functions**

#### **2.2.1 The status of payment data passed through the Interlinking components**

Payment data transmitted across the Interlinking system represent payments, expressed in euro, that have been irrevocably and finally debited from the account of the originator’s bank in the originating national RTGS system.

#### **2.2.2 Settlement between NCBs and the ECB**

The ECB and each of the NCBs should open an inter-NCB account on their books for each of the other NCBs and the ECB. In support of entries made on any inter-NCB account, each NCB and the ECB shall grant one another an unlimited and uncollateralised credit facility.

To effect a cross-border payment, the sending NCB/ECB credits the account of the receiving NCB/ECB held at the sending NCB/ECB; the receiving NCB/ECB debits the account of the sending NCB/ECB held at the receiving NCB/ECB. All inter-NCB accounts are maintained in euro.

#### **2.2.3 Provision of methods for message identification and error handling**

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

#### **2.2.4 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 (checking it is same day<sup>3</sup>) and the availability of the receiving

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<sup>3</sup> The value date is a feature of some domestic RTGS systems. The only value date in the Interlinking system is “today”.

NCB/ECB. If syntax errors or other reasons for rejection are detected, the sending NCB/ECB should handle the data according to domestic rules.<sup>4</sup>

The receiving NCB/ECB has to check all parts of the data (including a unique identifier to avoid double-crediting) to ensure that they comply with national rules, so that the account of the beneficiary bank can be properly credited.

### **2.2.5 The handling of payments under special circumstances**

If it is impossible to credit a beneficiary, the receiving NCB/ECB will immediately inform the sending NCB/ECB by means of a negative acknowledgement, stating the reason for not executing the payment. Reasons can be:

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

The sending NCB/ECB should handle the data according to domestic rules.<sup>4</sup>

## **2.3 The accounting system-related functions**

To meet the technical requirements for the daily processing of payments, each participating NCB and the ECB has to open an inter-NCB account on their books for each of the other NCB and the ECB.

## **2.4 End-of-day control functions**

At the end of the day, but before the final closing of the Interlinking system, each NCB sends the ECB a message with end-of-day information to check whether all payment messages have been exchanged correctly.

The end-of-day control procedures have to be finalised by a positive answer from the ECB. If it replies in the negative, the NCBs/ECB in question must initiate and finalise error detection procedures within 30 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 partners.<sup>5</sup>

## **2.5 The communication functions of the Interlinking components**

### **2.5.1 General remarks**

With the exception of two features, communication functions can be described within the “logical” approach used in the preceding section. By contrast with 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 with reference to events within the settlement process (debiting and crediting).

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<sup>4</sup> 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.

<sup>5</sup> NCBs/ECB could decide to end the business day and solve a technical problem “off-line”.

However, those requirements that go beyond the linkage of domestic systems are defined only for having a clear overview of TARGET. They do not create additional requirements for the Interlinking. The Interlinking requires only the communication that takes place between NCBs and/or the ECB.

### **2.5.2 The transmission of data via telecommunication lines**

To fulfil the “real-time requirements of the TARGET system”, payment data must be transmitted in the Interlinking system via telecommunication lines.

### **2.5.3 The provision of matching data formats**

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

NCBs or their operators are expected to handle incoming Interlinking messages such as SWIFT MT 202, MT 100 or MT 103 using SWIFT MT198 as an envelope.

The Interlinking component at each NCB also has to be able to create and transmit standardised messages for other services (handling of errors, end-of-day message check, transmission of management information data, etc.).<sup>6</sup>

### **2.5.4 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 beneficiary bank in the RTGS system has been successfully credited, the acknowledgement will be positive. If the processing cannot be completed due to the occurrence of an error, a negative acknowledgement will be sent to the sending NCB/ECB, stating the reason.

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

If an acknowledgement has not arrived within 30 minutes<sup>7</sup> of the debiting, the sending NCB must start error detection procedures.

### **2.5.5 Processing and transmission time within the Interlinking**

The standard time for a message to travel through the Interlinking system (transmission between Interlinking communication components) is estimated to be under ten seconds for 99% of transactions per day, and less than 15 minutes for the remainder (under normal circumstances).<sup>8,9</sup>

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<sup>6</sup> The Interlinking message types fall within the FIN message definition if a single message is less than or equal to 10,000 characters (free formatted message).

<sup>7</sup> 30 minutes should be considered as a maximum; it could be lowered in future if this proves advisable/possible.

<sup>8</sup> The figures in this paragraph should be seen as objectives. If another service provider is chosen, this may have huge effects on costs. Hence, the trade-off between speed and cost will be investigated carefully and these provisions may have to be revised.

## 2.5.6 Performance features

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

## 2.6 Availability function

### 2.6.1 General remarks

The user requirement concerning availability describes either the minimum amount of processing required in a given time or the maximum time allowed to process all transactions. For systems like TARGET or the Interlinking, this availability function should describe comprehensively what is needed (including contingency situations).<sup>10</sup>

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

### 2.6.2 Minimum requirements concerning availability

In addition to the processing and transmission time given above, the different systems involved have to fulfil the following criteria:

In the event of a disruption 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 adequate capacity is available within four hours.

In addition, TARGET as a whole has to provide facilities capable of completing the business day irrevocability and finality before the start of the next one (i.e. before the domestic RTGS systems open on the next business day), and infrastructure capable of carrying out the operations of the next business day.<sup>11</sup>

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<sup>9</sup> The time it takes to process and transmit a payment from one RTGS system to another (which is not an Interlinking requirement) was also defined by the Interlinking Task Force. It should be the sum of the time required in the sending and the receiving RTGS systems, including the communication between the RTGS system and the domestic Interlinking component (7.5 minutes each), plus Interlinking time as defined above, i.e. a total maximum time of 30 minutes (this definition covers the time between the debiting of the account of the ordering bank by the sending RTGS system and the crediting of the account of the beneficiary bank at the receiving NCB).

<sup>10</sup> For the purposes of the User Requirements, a distinction is made between 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 (e.g. switch to a back-up system after a disruption of a processing system). By contrast, a disaster is when the recovery time is not foreseeable (e.g. earthquake, nuclear bomb). The User Requirements deal only with contingency situations.

<sup>11</sup> Because the NCBs and the ECB are free to implement Interlinking application functions either 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 would go beyond Interlinking requirements.

## **2.7 Security functions**

### **2.7.1 General remarks**

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

Security features of the Interlinking system must provide a certain level of security 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 common minimum 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 takes a comprehensive approach. Security levels are defined for all areas. It is a task of the NCBs and the ECB to set and achieve an adequate security level in their own areas of responsibility.

### **2.7.2 The integrity, authenticity and non-repudiation of data during communication between NCBs and/or the ECB**

The methods used for communication between Interlinking components should include features protecting against threats to integrity, authentication and non-repudiation. These methods have to be designed so as to be secure and to remain secure for the foreseeable future. They should be implemented and monitored in such a way that makes sure that they will be used properly.

### **2.7.3 Confidentiality and protection against unauthorised access to the data at the network level**

Payment data that are communicated between Interlinking components at different NCBs/ECB have to provide an appropriate level of protection against loss of confidentiality. These methods should be designed so as to be secure and to remain secure for the foreseeable future. They should be implemented and monitored in a way that makes sure that they will be used properly.

## **2.8 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 and/or the ECB system in order to achieve sufficiently fast and secure communication between these components, in line with the requirements stated in this chapter<sup>12</sup>.

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<sup>12</sup> This solution gives the NCBs and the ECB maximum independence with regard to implementation.

### **3. CHANGE MANAGEMENT FOR USER REQUIREMENTS**

The User Requirements will be the binding reference paper for further steps of the project.

Each NCB and the ECB can make suggestions for additions or changes to the User Requirements. Suggestions will be evaluated by the responsible entities and will have to be formally adopted by the Governing Council of the ECB upon proposal by the Executive Board.

No changes shall be designed or implemented before the relevant proposal to amend the User Requirements has been adopted.'