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**Telecommunications and  
information exchange between  
systems — Recursive inter-network  
architecture —**

**Part 8:  
RINA general delimiting procedures**

*Télécommunications et échange d'information entre systèmes —  
Architecture récursive inter-réseaux —*

*Partie 8: Procédures générales de délimitation RINA*

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## Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives) or [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs)).

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6 *Telecommunications and information exchange between systems*.

A list of all parts in the ISO/IEC 4396 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html) and [www.iec.ch/national-committees](http://www.iec.ch/national-committees).

# Telecommunications and information exchange between systems — Recursive inter-network architecture —

## Part 8: RINA general delimiting procedures

### 1 Scope

This document provides a delimiting module that defines a mechanism for encoding Service Data Units (SDUs), the amount of data passed across the layer boundary within Protocol Data Units (PDUs), the amount of data sent to its peer. It is not necessary to use this document if each PDU carries precisely one SDU.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4396-1, *Telecommunications and information exchange between systems — Recursive Inter-Network Architecture — Part 1: Reference Model*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4396-1 apply.

<https://www.iso.org/obp/ui/#iso:code:4396-8> and <https://www.electropedia.org/> maintain terminology databases for use in standardization at the following addresses: 6-8

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 4 Detailed specification of the procedure

#### 4.1 General

The delimiting module produces on input, one or more User-Data fields for the error and flow control protocol (EFCP) to create PDUs; and on output, depending on quality of service (QoS) parameters, complete, incomplete, or partial SDUs for the user of the flow. Partial delivery refers to whole SDUs that are delivered incrementally, while incomplete delivery refers to an SDU that can have pieces missing. This implies that partial delivery of incomplete SDUs is possible. The described mechanism covers a range of policy options, allowing fragmentation of SDUs, concatenation of SDUs, and both fragmentation and concatenation of SDUs simultaneously. It also provides additional information needed for delivery despite gaps in the SDU stream, if delivery across a gap is permitted by the QoS-cube for the flow. The delimiting policy may be different between QoS-cubes. This module can be used with several QoS-cubes with different constraints on which flags can appear.

#### 4.2 Syntax

The User Data field of an EFCP Transfer PDU may contain SDU fragments, entire SDUs, or prescribed combinations of the two. The User Data Field syntax is:

<Data> ::= <lastFragment> | <midFragment> | <firstFragment> | <SDUData>

<PDUdata> ::= <Data> | [ <Length>< lastFragment > ] (<Length> <SDUdata>)\* [ < Length >< firstFragment > ]

<UserDataField> ::= <SDUDelimiterFlags> [<SDUSequenceNumber >] [ <PDUdata> ]

This syntax has the following properties:

- The SDUSequenceNumber may or may not be present in the PDU.
- The syntax of PDUdata permits the Length field to be omitted if the PDU contains a single SDU or fragment. The SDUDelimiterFlags field described below determines the type of the Data content in this case.
- If more than one SDU or fragment is present, the Length fields in conjunction with the SDUDelimiterFlags field described below shall be used to parse the PDUdata into its component fragments or SDUs.

SDUDelimiterFlags: 1 Byte

'08'X – SDUSequenceNumberPresent, when set(1) in the SDUDelimiterFlags indicates that a SDUSequenceNumber immediately follows the SDUDelimiterFlags field, preceding any fragment or SDU data.

The following flags in the SDUDelimiterFlags field define the PDUData syntax used to encode the remainder of the PDU Data field.

'04'X – noLength, indicates whether the PDU contains exactly one fragment or SDU and that the length delimiter is omitted on the single fragment or SDU. If noLength is set (1), the entire remainder of the PDU Data field is the Data, and the two low-order flags ('02'X and '01'X) are interpreted as follows:

'00'B – The PDU data contains a continuation (midFragment), that is, an SDU neither begins nor ends in this PDU.

'01'B – The PDU data contains the first fragment (firstFragment) of the next SDU in sequence.

'10'B – The PDU data contains the final fragment (lastFragment) of an SDU, completing it.

'11'B – The PDU data contains one complete SDU.

If the noLength flag is clear (0), a Length precedes each Data fragment or SDU in the PDU Data field, and the two low-order flags are interpreted as follows:

'00'B – The PDU data contains zero or more complete SDUs.

'01'B – The PDU data contains zero or more complete SDUs, followed by a firstFragment.

'10'B – The PDU data contains a lastFragment, followed by zero or more complete SDUs.

'11'B – The PDU data contains a lastFragment, followed by zero or more complete SDUs, followed by a firstFragment.

The high order 4 bits of the SDUDelimiterFlags field shall be 0.

Data: a variable number of data bytes: The content portion of an SDU or fragment of an SDU.

Length: SDUFragLen – This field contains the length of the Data (SDU or fragment of an SDU) following it that is being delimited. It is an error if the PDU data field contains an incomplete Length field. It is an error if the PDU Data field is not exactly consumed by the delimited SDUs and/or fragments.