INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

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SERIES F: NON-TELEPHONE TELECOMMUNICATION SERVICES

Telematic services – Public facsimile service

Operational requirements of the interconnection of facsimile store-and-forward units

ITU-T Recommendation F.163

(Previously "CCITT Recommendation")

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FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation F.163 was revised by ITU-T Study Group 1 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 19th of July 1996.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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OPERATIONAL REQUIREMENTS OF THE INTERCONNECTION OF FACSIMILE STORE-AND-FORWARD UNITS

(revised in 1996)

1 Introduction

A growing number of Administrations are offering store-and-forward facsimile (COMFAX) services to their customers. For the efficient and economical extension of these services across international boundaries, there is a need for the interconnection of the facilities used to provide these services.

2 Scope

2.1 This Recommendation describes the general principles and operational aspects of the COMFAX service when operated and interconnected between Administrations.

2.2 This Recommendation should be implemented in conjunction with Recommendation F.162 which describes the COMFAX service, and the relevant technical requirements of the T- and X-Series Recommendations. This Recommendation may also be used in connection with the provision of the bureaufax service as described in Recommendations F.170 and F.171.

3 Definitions

This Recommendation uses the terms listed below.

NOTE – Use of the terms "delivery", "submission", "transfer", does not imply any specific protocol implementation regarding the X.400-Series of Recommendations.

3.1 **Fax SFU**: A Fax SFU refers to the boundary within which the facsimile store-and-forward service is provided by one or more facsimile store-and-forward units under the control of one Administration. A Fax SFU must provide the functions of message submission, message delivery and, in the case of interconnection, message transfer.

3.2 **message delivery**: Message delivery is defined as the transfer of message data and responsibility for the message from a Fax SFU to a recipient address.

3.3 **recipient address**: A recipient address is defined as the ultimate destination of a message. A recipient address may designate a facsimile terminal or a storage device empowered to receive messages for a FAX recipient.

3.4 **message submission**: Message submission is defined as the transfer of message data and responsibility for the message from the originator to the COMFAX service (e.g. typically indicated by the successful completion of the T.30 protocol).

3.5 **message transfer**: Message transfer is defined as the transfer of message data and responsibility for the message from one Fax SFU (or transfer system) to another Fax SFU (or transfer system).

3.6 **transfer system**: A transfer system is defined as a system which accomplishes message transfer as defined above. A transfer system may or may not provide end user facsimile services.

3.7 **transit facility**: A transit facility is either a Fax SFU or a transfer system.

4 Overview

4.1 The interconnection of Fax SFUs is provided on the basis of bilateral agreement between the Administrations concerned.

4.2 The following two types of interconnection as illustrated in Figure 1 have been identified.

4.2.1 Interconnected store and forward is where Fax SFUs operated by two Administrations are directly connected.

4.2.2 Transit store and forward is where the Fax SFU transfers the facsimile message between Fax SFUs via other Fax SFUs or transfer systems.

4.3 Interconnection between COMFAX and other services using the Message Handling System (MHS) will be provided by the transfer system. Details are for further study.

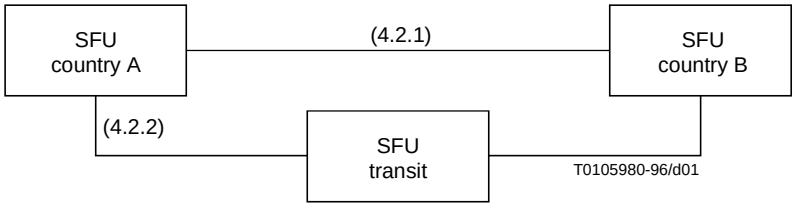


FIGURE 1/F.163

COMFAX interworking scenarios

5 Interconnection requirements

5.1 General

5.1.1 In the interconnection of Fax SFUs, the responsibility to deliver single and multi-address messages is transferred from the originating Fax SFU to one or more destination Fax SFUs.

5.1.2 In the interconnection of Fax SFUs, it is mandatory to provide two levels of notification to support the COMFAX service as defined in Recommendation F.162.

5.2 Information transfer unit

5.2.1 The basic unit of the inter-SFU communication is the Information Transfer Unit (ITU). This unit is classified as either a user ITU or a service ITU allowing easy identification of the function(s) for which cooperation is required.

5.2.1.1 There is only one type of user ITU, which is the user message. This user message consists of the customer's facsimile message and some additional information (e.g. address).

5.2.1.2 There are two types of service ITUs:

a) Level 1 notification (L1N) – Indicates the successful and/or unsuccessful transfer of responsibility for the user message to the destination SFU. An LlN conveys the information associated with the successful or unsuccessful transfer of responsibility on a per recipient basis. Table 1 lists the contents of the L1N.

TABLE 1/F.163

Contents of level 1 notification (L1N)

Common field
original message identifier
recipient address
original encoded information types
converted encoded information types
Successful transfer field
last transfer time
Unsuccessful transfer field
reason code
diagnostic code

b) Level 2 notification (L2N) – Indicates the successful or unsuccessful delivery of the responsibility for and delivery of the user message to the recipient address. Responsibility is transferred to a user by transmission of the message to either a facsimile terminal or a storage device empowered to receive messages for a facsimile recipient. Table 2 lists the contents of the L2N.

TABLE 2/F.163

Contents of level 2 notification (L2N)

Common field
original message identifier
recipient address
last encoded information types
SFU reference
Successful delivery field
time of delivery to recipient address
receiving terminal identifier
number of pages
duration of delivery
Unsuccessful delivery field
reason code
diagnostic code
last attempt time
number of attempts
delivered

5.2.2 Information transfer units should be transferred between Fax SFUs using Protocol Data Units (PDUs) in accordance with the X.400-Series Recommendations.

5.2.3 The encoded message part within the user information transfer unit should be indicated as group 3 facsimile for interconnection. The use of other facsimile formats and encoded information types is subject to bilateral agreement.

5.2.4 Fax SFUs shall transfer recipient addresses using the originator/recipient (O/R) address form defined in Recommendation F.401.

5.3 Transit arrangements

5.3.1 The use of transit facilities for message transfer is subject to agreement of the service providers involved.

5.3.2 A facsimile message may pass through a transit facility consisting of a Fax SFU or some other transfer system. Where messages are routed via transit facilities, the transit facility is required to support the first level notification.

5.3.3 Where a message contains a multiple recipient address, it shall be possible for the transfer facility to accept responsibility for some recipient addresses and to onward transfer to one or more Fax SFUs or transfer systems the responsibility for other recipient addresses.

6 Service interworking principles

The classification of the interworking requirements is shown in Table 3.

TABLE 3/F.163

Interworking requirements of service facilities

Service Facility Requirement	ORIG	TRANS	DEST	Reference
Single address message	M	M1	M	6.1.1
Multiple address message	C	M1	M	6.1.2
Address list codes	C	N/A	N/A	6.2
Message identification	M	M	M	6.3
Class of message delivery	C	M1	M	6.4
Message deferral	C	N/A	N/A	6.5
Cover page	C	N/A	M	6.6
Advice of successful message transfer (positive L1N)	C	M	M	6.7
Advice of unsuccessful message transfer (negative L1N)	M	M	M	6.7
Advice of successful message delivery (positive L2N)	M	M1	M	6.8
Advice of unsuccessful message delivery (negative L2N)	M	M1	M	6.8
Facsimile format conversion	C	N/A	C	6.9

M	Mandatory
M1	Mandatory. In the case that the transit facility does not take responsibility for any message delivery, the service facility shall be conveyed.
C	Conditional
N/A	Not applicable
ORIG	Originating Fax SFU
TRANS	Transit facility
DEST	Destination Fax SFU

6.1 Message addressing

6.1.1 Single address message

In the interconnection of Fax SFUs a single address message should be supported as defined in Recommendation F.162.

6.1.2 Multiple address message

In the interconnection of Fax SFUs a multiple address message should be supported as defined in Recommendation F.162.

6.2 Address list codes

Expansion of address lists should be performed at the originating Fax SFU. Expansion of address lists at other Fax SFUs is for further study.

6.3 Message identification

On successful submission of a message, the originating Fax SFU shall assign a globally unique identification to the message. The message identifier is used to identify the message in notifications between Fax SFUs.

6.4 Class of message delivery

In the interconnection of Fax SFUs, the three classes of message delivery, urgent, normal and non-urgent, as defined in Recommendation F.162, should be supported.

6.5 Message deferral

The storage of messages to the customer specified time for message delivery, as described in Recommendation F.162, should be carried out by the originating Fax SFU.

6.6 Cover page

Cover page is described in Recommendation F.162. The customer choice of cover page shall be transferred from the originating Fax SFU to the destination Fax SFU.

6.6.1 Support of no cover page request

When no cover page is requested, no cover page shall be provided.

6.6.2 Support of the COMFAX service cover page

The destination Fax SFU generates the COMFAX service cover page. The layout of the page is a local matter. Table 4 specifies which Fax SFU provides the COMFAX service cover page contents.

6.6.3 Support of customer defined cover page

Use of a page description method of providing customer defined cover pages is for further study.

6.7 Advice of successful/unsuccessful message transfer

6.7.1 A L1N includes information indicating the successful and/or unsuccessful acceptance of responsibility for the message on a per recipient basis.

6.7.2 A L1N which only contains information regarding unsuccessful transfer shall be generated by either the destination Fax SFU or the transit facility as soon as it is determined that responsibility for the message on a per recipient basis cannot be accepted or transferred.

6.7.3 A L1N for successful transfer shall only be returned when requested. The request shall be processed on a per recipient address basis.

6.7.4 An unsuccessful message transfer is indicated by the generation of a negative L1N. (There is no requirement for the generation of a negative L2N in this case.) It shall be mandatory to return a L1N for unsuccessful transfer on a per recipient basis.

TABLE 4/F.163

Provision of COMFAX Service cover page contents

Field	Provided by
Image field	O/D (Note 1)
Recipient information	
NAME: choice of	
Personal name	O
Common name	O
Free form name	O
ORGANIZATION	O
ORGANIZATIONAL UNIT(S)	O
PHYSICAL ADDRESS LINES	O
FAX NETWORK ADDRESS	O
TELEPHONE NUMBER	O
Message information	
Pages	D
Priority	O
Submission date and time	O
Message Reference	O
Subject	O
Originator information	
NAME: choice of	
Personal name	O
Common name	O
Free form name	O
ORGANIZATION	O
ORGANIZATIONAL UNIT(S)	O
PHYSICAL ADDRESS LINES	O
FAX NETWORK ADDRESS	O
TELEPHONE NUMBER	O
Additional recipients	(Note 2)

O Provided by originating Fax SFU

D Provided by destination Fax SFU

NOTES

1 Provision of service providers' images are by bilateral agreement. If joint service providers' images are required no extension to the image field size is allowed.

2 Display of additional recipients is an item for further study.

6.8 Advice of successful/unsuccessful message delivery

6.8.1 A positive L2N indicates successful message delivery and shall be returned to the originating Fax SFU on a per recipient basis. A L2N for successful message delivery shall only be returned when requested. The request shall be processed on a per recipient basis.

6.8.2 A negative L2N indicates unsuccessful message delivery and shall be returned to the originating Fax SFU on a per recipient basis. It is mandatory to return a L2N for unsuccessful delivery.

6.9 Facsimile format conversion

The facsimile format conversion service facility enables the content (image) of a facsimile message to be converted from one format to another. Conversion may be performed on the paper size, the resolution of the message and so on.

When a message is transferred to another Fax SFU, the message shall be in a basic format of group 3 using facsimile format conversion unless there is a bilateral agreement. If such a bilateral agreement exists, the destination Fax SFU shall either support conversion of the image of a message to deliver it or shall not deliver a message whenever it detects that unsupported conversion is required.

Conversion shall be an automatic facility and shall not require additional procedures for users. When conversion is supported in a Fax SFU, it shall be performed in a way that the image of the original message is best preserved. That is, conversion is performed only on the unsupported features trying to use values closer to the basic ones.

Conversion that may result in loss of information may optionally be prohibited by the originator. The details of transferring information on conversion prohibition are for further study.

The details of conversion rules and possible combinations of conversions are defined in relevant T-Series Recommendations.

7 Quality of service

7.1 The quality of the image, as received from the originating facsimile, terminal should not be adversely affected by any Fax SFU, transit facility, or any transmission facility between Fax SFUs through which the image may pass.

7.2 The following quality of services objectives are defined for messages passed across the international boundary for delivery by a destination Fax SFU. The overall service delivery objectives are specified in Table 3/F.162. In order that the destination Fax SFU is able to meet the objectives as stated in Table 3/F.162, the originating Fax SFU should transfer the message according to the objectives illustrated in Figure 2 and described in Table 5.

The objectives for times T_A and T_B are defined in Recommendation F.162.

The objectives for times T_1, T_2, and T_3 should be met for at least 95% of messages during any 1 hour period.

The number of attempts to deliver a message to the destination terminal and the interval between attempts are a local matter.

7.3 The quality of service targets specified in Table 5 should not be affected by any transit or transmission facilities.

7.4 If a message is interrupted during the delivery from the destination Fax SFU to the destination terminal, subsequent attempts to deliver the message should commence with the first page not successfully delivered. The recipient shall be given sufficient information to correlate the parts of the message. In addition, the number of pages delivered in each partial transmission are required to be returned to the originating Fax SFU.

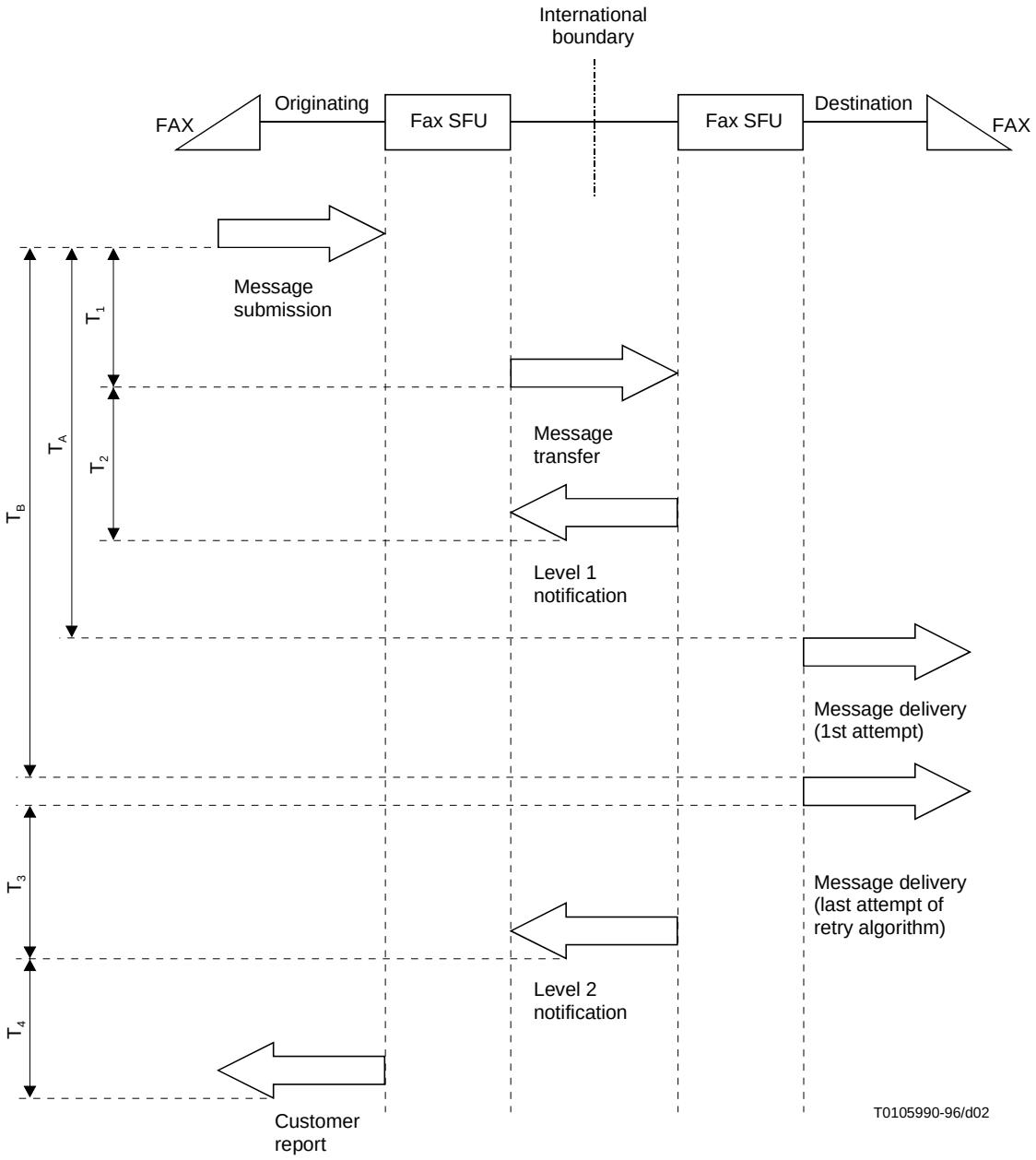
7.5 System design and dimensioning should be such that the quality of service objectives are met for at least 95% of messages received during any 1 hour period.

7.6 Observations on the quality of service

Administrations shall make observations to evaluate the quality of the COMFAX service across national boundaries.

7.7 Duration of service

The national and international COMFAX facilities shall be open continuously.



NOTES

1 The objectives for times T_A and T_B are defined in Recommendation F.162.

2 The objectives for times T_1, T_2, and T_3 should be met for at least 95% of messages during any 1 hour period.

3 The number of attempts to deliver a message to the destination terminal and the interval between attempts are a national matter.

FIGURE 2/F.163

TABLE 5/F.163

Quality of service targets

Time	Description	Grade of delivery	Target (hours)
T_A	Time from the end of submission of the message, or the time specified for the deferred delivery, to the start of the first call attempt	Urgent Normal Non-Urgent	0.25 1.0 8.0
T_B	Time from the end of submission of the message, or the time specified for deferred delivery, to the forced generation of a negative second level notification and termination of message delivery attempt (unless transmission has already commenced)	Urgent Normal Non-Urgent	1.0 4.0 212.0
T_1	Time from the end of the submission of the message, or the time specified for deferred delivery, to the end of the transfer of the message from the originating Fax SFU to the destination Fax SFU	Urgent Normal Non-Urgent	0.15 0.6 4.8
T_2	Time from the end of the transfer of the message from the originating Fax SFU to the destination Fax SFU, to the end of the transfer of the first notification from the destination Fax SFU to the originating Fax SFU	All	0.15
T_3	Time from the end of message delivery, or the forced generation of a negative second level notification, to the end of the transfer of a second level notification from the destination fax SFU to the originating Fax SFU	All	0.15
T_4	Time from the end of transfer of a second level notification from the destination Fax SFU to the originating Fax SFU, to the generation of a customer report	All	Local matter

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