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CCITT

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THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

TELEMATIC, DATA TRANSMISSION, ISDN BROADBAND, UPT AND TELECONFERENCE SERVICES:

OPERATIONS AND QUALITY OF SERVICE

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

Recommendation F.163

Geneva, 1992

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT 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 Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation F.163, was prepared by Study Group I and was approved under the Resolution No. 2 procedure on the 4th of August 1992.

CCITT NOTE

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

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Recommendation F.163

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

(1992)

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 intentional 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 are 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/F.163 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.

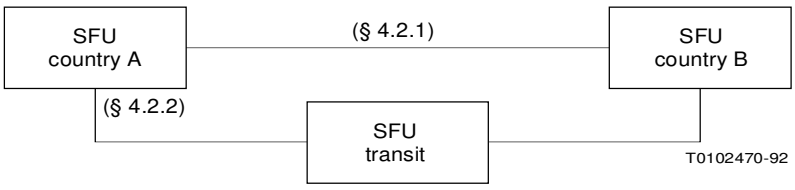


FIGURE 1/F.163
COMFAX interworking scenarios

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/F.163 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/F.163 lists the contents of the L2N.

TABLE 2/F.163

Content 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
number of pages delivered

5.2.2 Information transfer units should be transferred between Fax SFUs using protocol data units (PDU) in accordance with the CCITT 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/F.163.

TABLE 3/F.163

Interworking requirements of service facilities

Service facility requirement	ORIG	TRANS	DEST	Section 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 faci1ity
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/F.163 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

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

Note 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*

If a Fax SFU supports facsimile formats other than group 3, then the Fax SFU shall support conversion between group 3 and those facsimile formats.

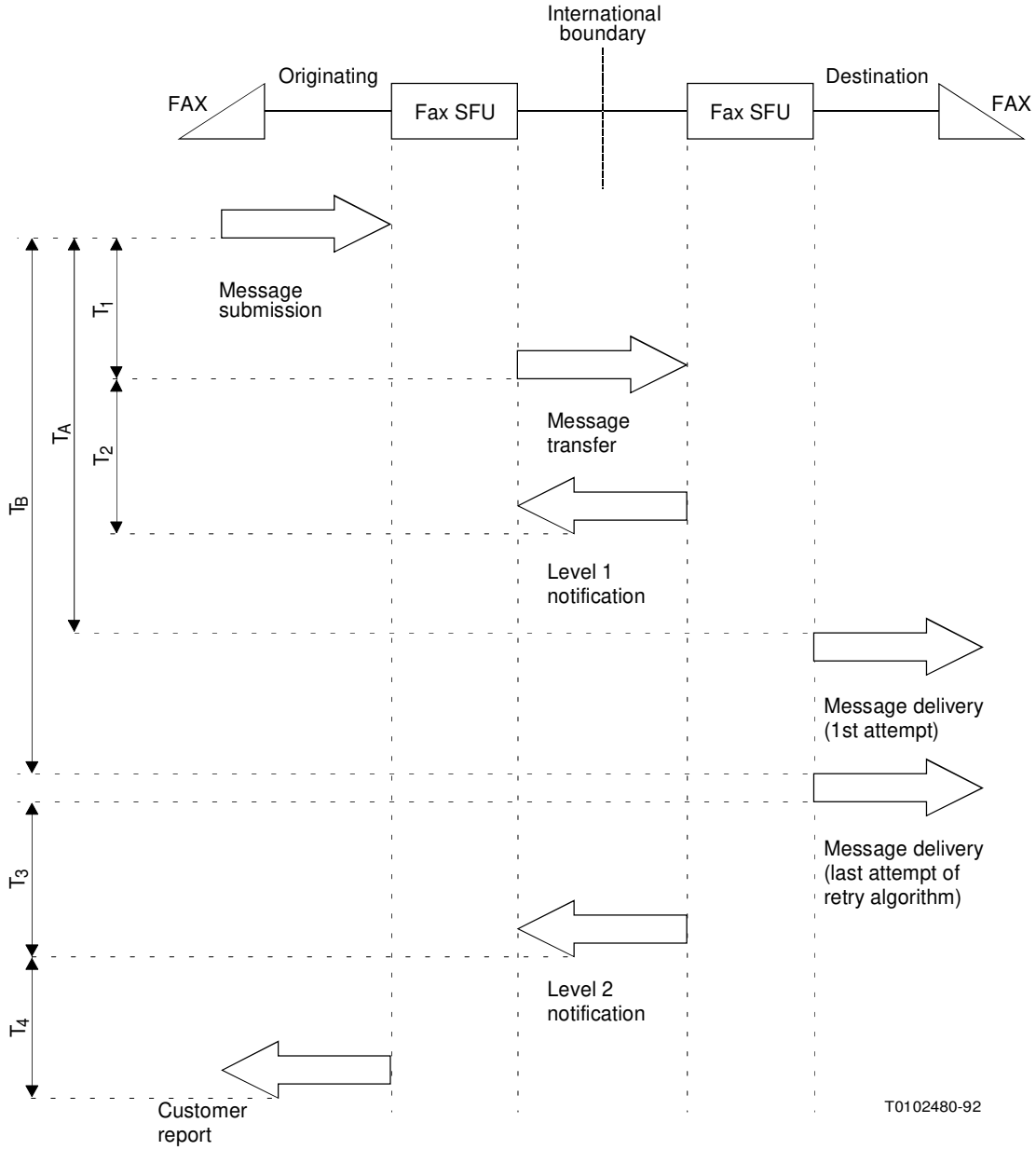
Transfer of the message in formats other than group 3 is by bi-lateral agreement.

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/F.163 and described in Table 5/F.163.

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



Note 1 – The objectives for times T_A and T_B are defined in Recommendation F.162.
Note 2 – The objectives for times T_1, T_2, T_3 should be met for at least 95% of messages during any 1 hour period.
Note 3 – The number of attempts to deliver a message to the destination terminal and the interval between attempts are national matter.

FIGURE 2/F.163

The objectives for times T_1, T_2, 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/F.163 should not be affected by any transit or transmission facilities.

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	0.5 2.0 18.0
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 2nd level notification and termination of message delivery attempt (unless transmission has already commenced).	Urgent Normal Non-Urgent	2.0 12.0 24.0
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	0.3 1.2 10.8
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 1st level notification from the destination Fax SFU to the originating Fax SFU.	All	0.25
T_3	Time from the end of message delivery or the forced generation of a negative 2nd level notification, to the end of the transfer of a 2nd level notification from the destination fax SFU to the originating Fax SFU.	All	0.3
T_4	Time from the end of transfer of a 2nd level notification from the destination Fax SFU to the originating Fax SFU, to the generation of a customer report.	All	Local matter

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 intentional COMFAX facilities shall be open continuously.