Publicly Available Specification

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Contents

Foreword

This document is the Publicly Available Specification (PAS) of the TETRAPOL land mobile radio system, which shall provide digital narrow band voice, messaging, and data services. Its main objective is to provide specifications dedicated to the more demanding PMR segment: the public safety. These specifications are also applicable to most PMR networks.

This PAS is a multipart document which consists of:

Part 1 General Network Design

Part 2 Radio Air interface

Part 3 Air Interface Protocol

Part 4 Gateway to X.400 MTA

Part 5 Dispatch Centre interface

Part 6 Line Connected Terminal interface

Part 7 Codec

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Part 10 Inter system Interface

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Part 12 Network Management Centre interface

Part 13 User Data Terminal to system Terminal interface

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Part 18 Base station to Radioswitch interface

Part 19 Stand Alone Dispatch Position interface

1. Scope

1.1. Object

The purpose of this PAS 0001-4, Gateway to X.400 MTA, is to define the protocol of the gateway to the message handling system (MHS) with an external MHS at reference point R8 (see refer to PAS 0001-1 [1]).

1.2. Domain of application

This document applies to the TETRAPOL system.

1.3. Description of the document

This document is structured according to the different interface layers between the RSW and the Message Transfer Agent X.400 MTAs of the external MHS. Interface characteristics are described for each level.

2. Normative references

This PAS incorporates by dated and undated reference, provisions from other publications.These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this PAS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] PAS 0001-1: "TETRAPOL Specifications; General Network Design".

[2] PAS 0001-13-1: "TETRAPOL Specifications; UDT and ST Protocol; Submit delivery protocol".

[3] ISO 8073 ITU-T X.224: "Open systems interconnection - Transport - Protocol specification".

[4] ITU-T X.225 | ISO 8327: "Information processing systems; Open Systems Interconnection; Connection oriented session protocol specification".

[5] PAS 0001-3: "TETRAPOL Specifications; Air Interface Protocol".

[6] PAS 0001-11: "TETRAPOL Specifications; Gateway to external network".

[7] ITU-T X.400 to X.430 (1984): "Information Technology; Message Handling Systems".

[8] European Prestandard ENV 41202: "Private Message Handling Systems; User Agent and Message Transfer Agent Accessing to an Administration Management Domain".

[9] European Prestandard ENV 41201: "Private Message Handling Systems; User Agent and Message Transfer Agent; Private Management Domain to Private Management Domain".

[10] PAS 0001-15-2: "TETRAPOL Specifications; Gateway to EDT; EDT Transport and session protocol".

3. Definitions, and abbreviations

3.1. Definitions

For the purposes of this PAS the following definitions apply:

External MHS: Message Handling system composed of X.400 MTA servers.

External Subscriber: Subscriber of an external MHS.

MHS Message Handling System: the set formed by the interworking User Agents (UAs) and the Message Transfer Agents (MTAs) constitute the Message Handling system (MHS).

System MHS: Message Handling system of the TETRAPOL system, included in the SwMI (UA and MTA are co-located in the SwMI).

Threshold time: this is the maximum time a message is kept in the recipient MTA of the system (calculated as the difference between the system date at a given moment and the date the message was submitted to the originator MTA).

X.400 MTA: MTA of an external MHS, MTA not managed by the system.

3.2. Abbreviations

For the purposes of this PAS the following abbreviations apply:

A/311	CEN/CENELEC European profile for X.400
ADMD	Administration Management Domain between PRMD and ADMD
DCE	Data Circuit Equipment
DCN	Delivery Confirmation Notification
DCP	Data Connection reference Point
DFN	Delivery Failure Notification
DT	Data Terminal (UDT or EDT)
DTE	Data Terminal Equipment
EDT	External Data Terminal
EDT-DCP	EDT Data Connection reference Point
FS	Fast Select
HRSW	Home Radio Switch
ID	Identifier or identification
IM	Inter-Personal Message
IPM	Inter-Personal Messaging
KMC	Key Management Center
LC	Logical Channel
MD	Management Domain
MHS	Message Handling system
MPDU	Message Protocol Data Unit
MT	Message Transfer
MTA	Message Transfer Agent
MTS	Message Transfer system
O/R	Originator/Recipient
OSI	Open system Interconnection
P1	Message Transfer Protocol
P2	Interpersonal Messaging Protocol
PI	Protocol Identifier
PAS	Public Available Specification
PMR	Private Mobile Radiocommunications
PRMD	Private Management Domain
RN	Regional Network
RR	Delivery Report
RSW	Radio Switch
RX.25	X.25 network to which the RSW connects

SAP	Service Access Point
SDP	Submit/Delivery Protocol
SMPDU	Service MPDU
SPDU	Session Protocol Data Unit
SR	Status Report
SSAP	Session Service Access Point
SSDU	Session Service Data Unit
ST	system Terminal
ST-DCP	ST Data Connection reference Point
STS	Reliable Transfer Server
SwMI	Switching and Management Infrastructure
TPDU	Transport Protocol Data Unit
TSAP	Transport Service Access Point
TSDU	Transport Service Data Unit
UA	User Agent
UAPDU	User Agent Protocol Data Unit
UDT	User Data Terminal
UMPDU	User Message Protocol Data Unit
UTC	Universal Time Co-ordinated
VC	Virtual Circuit
VRSW	Visited RadioSwitch
X.400-DCP	X.400 Data Connection reference Point

4. MTA - X.400 Protocol

4.1. Presentation of the interface

4.1.1. Using the interface

The system RSW connects to the external MHS with transfers carried out during an Interpersonal Messaging transaction.

This document describes the Transfers between a system RSW and a X.400 MTA. The X.400 MTA directly accesses the MTA of the recipient Home RSW.

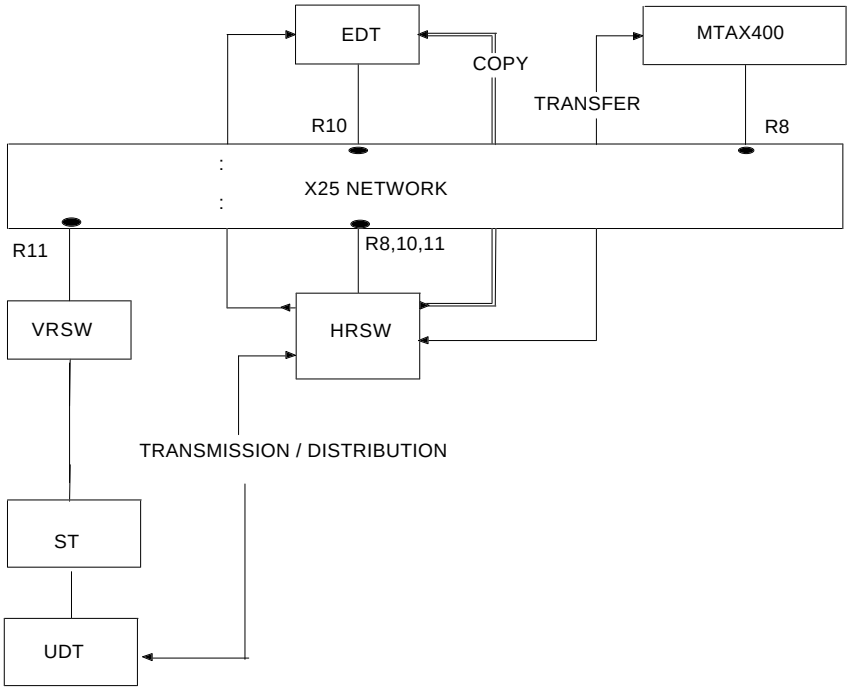


Figure 1: Positioning of X.400 MTA in TETRAPOL

This part allows PRMD to PRMD dialogue without using an ADMD as defined in ENV41202 [9] some services are not defined in ITU-T X.400 to X.430 (1984) [7] and so they are not described here.

4.1.2. Interface Layer structure

The interface between a system RSW and a X.400 MTA server shall be structured in layers.

The layers shall be:

- layers 1 to 3, X.25;
- layers 4 and 5, Transport and Session;
- layer 6, reliable transfer layer (RTS);
- layer 7 and above, layers specific to the application of an X.400 messaging.

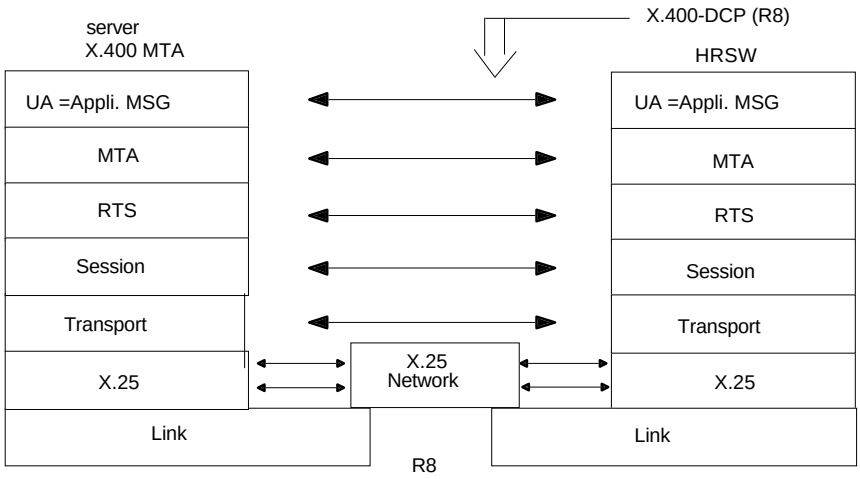


Figure 2: X.400 MTA Protocol Stack

4.2. Interface of levels 1 to 3

4.2.1. X.25 levels 1-3

The interface of levels 1 to 3 shall concern the X.25 Network which are described PAS 0001-11 [6] and annex F.

4.3. Interface of levels 4 and 5

The interface of levels 4 and 5 shall conform to the OSI level 4 and 5 protocols.

This sub clause defines the layers of levels 4 and 5 of the RSW's Data Connection reference Points (DCP).

The profile of layers 1 to 3 shall concern the connection of the RSW to the X.25 network.

Layers 4 and 5 shall concern equipment which is connected to the RSW via the X.25 network:

X.400 MTAs are external to the system (external Message Handling Service servers) and connect to the RSWs X.400-DCP.

Communications management provides a data exchange service.

This includes physical, link, network, transport and session levels.

The RSW connects to the X.25 network through a point to point leased line.

Session	CCITT X.225
Transport	CCITT X.224 class 2
Network	X.25 Level 3
Link	X.25 LAP B
Physical	V.24/V.28

Figure 3: Communication layers

4.3.1. Transport level

4.3.1.1. Messaging Transport Profile

The Transport layer shall comply with the ITU-T X.224 (1984) [3], which is equivalent to the ISO 8073 standard.

Class 2 is used to enable the multiplexing of several session connections on the same virtual circuit.

The X.400 standard stipulates that only Class 0 is mandatory. Class 1 is optional.

The choice of Class 2 improves performance, without being in conflict with the standards (alternative to Class 0 is always possible).

The transport connection between the MTAs of the system MHS is done in class 2.

The class transport used for transport connection between system MTA and the X.400 MTA server is precised in ENV41202 [8] (choice among class 0 and class 2).

Functions used for data transport are:

- concatenation and separation of several TPDUs in one NSDU;
- segmenting and reassembling a TSDU into several TPDUs (base function of the transport layer);
- transport level flow control;
- transport connection identification;
- TSDU delimiting.

The "expedited data" function is not used.

4.3.1.2 Parameters used by the Transport Layer

These parameters shall be negotiated during the connection request.

Parameters of the TPDU Connect request (CR):

- CDT: initial credit = value greater than the window allocated to the peer entity: 7;
- Set to zero destination reference;
- Source reference = supplied by the RSW or the X.400 MTA sending the TPDU CR;

Transport class:

- preferred class = 2 for the RSW;
- alternative class = 0 for the RSW.

preferred and alternative class for the X.400 MTA precised in annex E.

Options:

- use extended format = no;

- use of explicit flow control in class 2 = yes (zero status).

ID of system TSAP:

- TSAPAX.400 for X.400 messaging.

ID of X.400 MTA TSAP:

- TSAP for X.400 messaging is defined in annex E.

TPDU size (proposed):

- 1024 bytes is proposed by the RSW;
- size proposed by the X.400 MTA is precised in annex E.

Version no. = 0000 0001 (by default).

Additional options = no use of expedited data.

The other elements of the TPDU CR are not used.

Parameters of the TPDU Connection Confirmation (CC):

- CDT (initial credit) = 7;
- Destination reference = copy from the "source reference" of the TPDU CR;
- Source reference = supplied by the recipient sending the TPDU CC.
- Chosen class:
  for X.400 MTA-RSW connections: defined in annex E.
- Chosen options:
  - use of extended format = no;
  - use of flow control = yes.
- TPDU size:
  for X.400 MTA-RSW connections: defined in annex E;
  1024 bytes for RSW - RSW connections.
- Additional options = no use of expedited data.

All the other parameters of the TDPU CC are not used.

4.3.2. Session level

4.3.2.1. Presentation

The session complies with ITU-T X.225 (1984) [4], which is identical to the ISO 8327 standard.

The OSI session software of the RSW allows a choice of functional units and units used when opening a session, according to the session user's request. It is therefore possible to manage two sessions with different profiles in parallel.

Applications which use the OSI session do not send an SSDU greater than 16 Kbits.

A session which Supports X.400 is unidirectional and, when established, it is not possible to coordinate the token of both directions.

If several messages have to be sent, an originator MTA can establish several simultaneous sessions with the same recipient MTA: use of transport Class 2 multiplexing enables these sessions to use the same virtual circuit.

The maximum number of simultaneous sessions is limited by the configuration (see annex C).

When this number is reached the sessions are maintained as long as the originator MTA has messages to send to the same recipient MTA.

If the recipient MTA wants to transmit messages to the originator MTA, it must establish another virtual circuit, which will be able to multiplex sessions from the recipient to the originator.

The session closing primitives offer re-use of the transport connections to the remote correspondent.

4.3.2.2. X.400 Messaging session

This session is established between RSW and an X.400 MTA. It is used for X.400 protocol elements (RTS, P1 et P2) for Inter-Personal Messaging.

The session profile for X.400 complies with use of the session defined in Recommendation X.410.

In the rest of this document, these sessions are called "X.400 Sessions".

4.3.2.3. Opening and closing an X.400 session

The session is opened by the originator MTA: RSW or X.400 MTA.

The session is closed on the initiative of the originator RTS on expiration of an inactivity timer:

- RSW end: the inactivity timer to close the session connection is fixed at 30s;
- X.400 MTA end: precised in annex E.

4.3.2.4. Profile of the X.400 session

The functional units (FU) of the X.400 session are:

- Kernel;
- Half-duplex transmission;
- activity management;
- exceptions (mandatory for RTS X.410);
- minor synchronise (mandatory for RTS X.410).

List of protocol elements used:

- FU Kernel:

Session Connection : CN, AC, RF
Normal Data Transfer : DT
Give Tokens : GT (basic concatenation)
Please Tokens : PT
Normal end : FN, DN
abort by user}
abort by supplier} : AB, AA

- FU Exceptions:

Exception data (user) : ED
Exception report (supplier): ER

- FU Activity management:

Activity start : AS
Activity end : AE, AEA
Activity discard : AD, ADA

4.3.2.5. X.400 Session connection request parameters

Parameters of the SPDU_CN (connection) protocol element:

- Connect Identifier:

Calling Session Service User Reference;
SSAP address = TSAP address identifier;
Common reference: UTC time (local time and UTC delta);
Additional reference information: not used.

Connect / accept item: parameter absent;

Values of sub-fields are positioned by default and have the following meanings;

Protocol options: no concatenation in extended mode;

Maximum TSDU size set to zero: the size of the TSDU is unlimited and there is no segmenting.

Version number: 1

Initial serial number: parameter absent;

Token setting item: the tokens are set to the calling entity;

Data token: bits 1 and 2 = (0,0)

Activity token: bits 5 and 6 = (0,0)

- User requirements:

This parameter is coded according to the functional units chosen, which are:

b1 = 1	Half-duplex Transmission	: yes
b2 = 0	Duplex transmission	: no
b3 = 0	Expedited Data	: no
b4 = 0	Minor synchronise	: no
b5 = 1	Major synchronise	: yes
b6 = 0	Resynchronise	: no
b7 = 1	Activity management	: yes
b8 = 0	Negotiated release	: no
b9 = 0	Capability data exchange	: no
b10 = 1	Exceptions	: yes
b11 = 0	Typed Data	: no
b12 to b16 = 0	Reserved Bits	: no

- Calling SSAP Identifier:

  Use forbidden by X.410

- Called SSAP Identifier:

  Use forbidden by X.410

- User Data:

  Yes (user data supplied by X.410)

4.4. Interface of Levels 6 and 7

The interface of levels 6 and 7 shall concern:
- RTS reliable transfer protocol;
- X.400 messaging presentation level;
- X.400 messaging application level.

This clause gives the specifications of the upper layers interface, at the X.400 Reference Point R8 defined in the system (see PAS 0001-1 [1]).

This interface connects one RSW from the system MHS to an X.400 MTA server of an external MHS, or two RSWs.

All the operating rules of the X.400 Recommendations in the system are defined. This profile specifies the interworking conditions between the X.400 MTA services and the services of the system.

The local UA functions are not included in this profile.

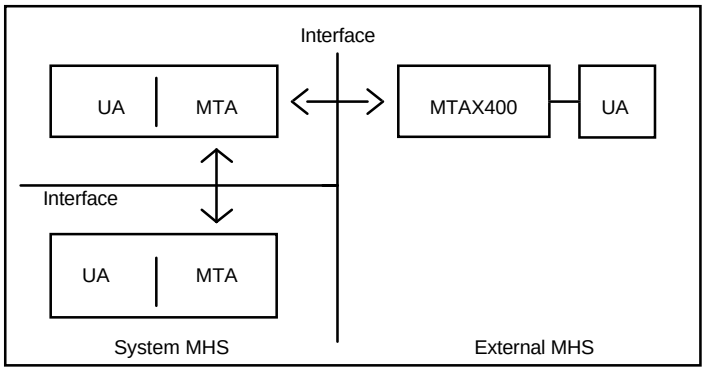


Figure 4: MTA positioning

This subclause also details the characteristics of the X.4OO layers profiles used by the system MHS.

This subclause document describes following profiles:

- the interface with lower layers (transport and session);
- the RTS service elements and protocol;
- the P1 service elements and protocol;
- the P2 service elements and protocol.

4.4.1. Characteristics of the interface

4.4.2. Main choices

The X.400 functional profile described here is a subset based on the profile defined in ITU-T X.400 to X.430 (1984) [7], adapted to the needs of Inter-Personal Messaging.

The following hypotheses are considered:

- an MTA is located in each RSW. It dialogues by using the X.400 protocol with the X.400 MTAs; for exchanges between UDTs and subscribers of an external MHS.

The MTAs of the system MHS form a single private domain (see the name in annex E).

The external MHS may be constitute from several private domains, but the system knows only a single private domain of the external MHS.

All accesses to messaging services external to the system MHS (public or private domain) is to be supported by the X.400 MTA servers. The MTAs of the system do not know its profile.

- The same profile is defined for exchanges between the private domain of the system MHS and the private domain of the external MHS (from RSW to X.400 MTA).

- The profile is minimal, to ensure optimal performance while conforming to standards.

- Each X.400 MTA takes charge of exchanges between its own subscribers and the system MHS.

- Each RSW knows an X.400 MTA (one or several MTAs: see configuration X.400-2).

- There is no alternate MTA for an inaccessible RSW: the message is considered to be non-delivered.

- The X.400 MTA carries out the relays required between the RSWs and external subscribers.

- If an external subscriber send a message to an UDT, an X.400 MTA must transfer the message to the recipient UDT'S HRSW (no relay is done inside the system).

- The system MTA carries out a single relay between the submission and the delivery of a message (no intermediary MTA).

- The system does not carry out coding conversion when sending or delivering messages. The originator and recipient terminals must interpret compatible code types.

List of configuration choice (non exclusive):

Configuration X.400-1:
The system offers the possibility to define an alternate MTA for each X.400 MTA: if an X.400 MTA is inaccessible, the RSW can send the message to another X.400 MTA designated as an alternate.

Configuration X.400-2:
A system MTA proposes to manage simultaneously from 1 to 4 accesses to the external MHS.

4.4.3. Characteristics of the system's X.400 profile

4.4.3.1. X.410

In accordance with the X.410 standard, each message shall form an independent activity.

4.4.3.2. Delivery notification

Delivery confirmation notifications shall be requested by the originator DT via the originator MTA.

The delivery failure notification service is selected.

The delivery confirmation notification service is selected, but shall not be used systematically to avoid:

- doubling disk accesses for each message soliciting a delivery notification (delivery confirmation notifications are "message secured", see definition in PAS 0001-1 [1]);
- increasing traffic on the single RSW-X.25 network link;
- this 19200b/s link would be loaded with delivery confirmation notifications;
- occupying X.25 network-allocated virtual circuits too long and risking bottlenecks during heavy traffic.

The system MHS makes the protocol P1 delivery notification service available, but the P2 protocol receipt notification is not selected.

4.4.4. Use of X.400 protocol

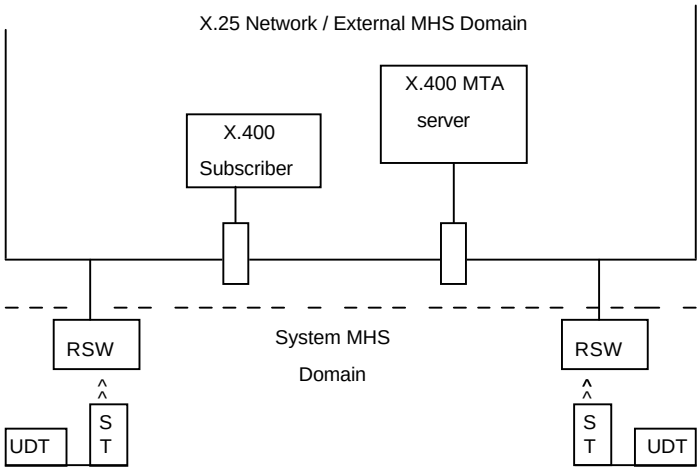


Figure 5: Domain

Each RSW includes an MTA function and its local UA, which manage the inter-personal messaging of all the regional network's home terminals.

Only exchanges between HRSW and X.400 MTA server or two HRSW use X.400 procedures.

Submission and delivery transactions between a X.400 MTA server and its subscribers are carried out according to specific X.400 MTA protocols. The profile used between the external subscribers and the X.400 MTA is not known by the system.

The X.400 profile is used on the X.400 MTA - HRSW link for the communications between external subscribers and UDTs.

4.4.5. Organisation in management domain

All X.400 MTA messaging servers form a private management domain, all system servers form another private management domain.

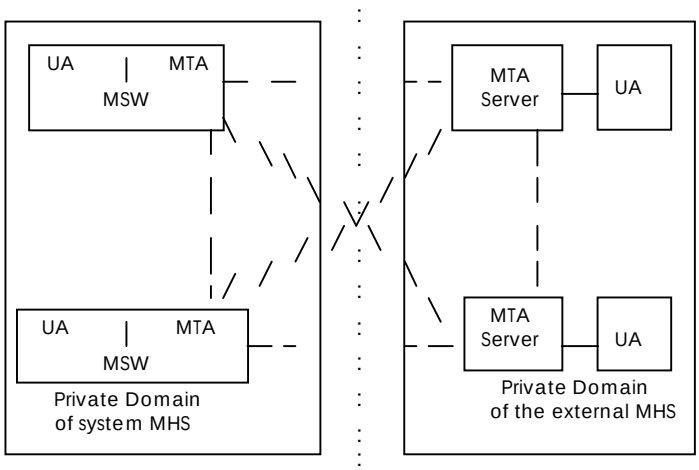


Figure 6: Private domains

MTA of the system MHS can only access the X.400 MTA servers of one external MHS. Other administration or private management domains cannot be directly accessed. Access to other external messaging is a relay function of the X.400 MTA and goes beyond the scope of this document.

4.4.6. Naming and routing

4.4.7. Naming

Outside the MHS, UDT terminals shall be designated by the address, in RFGI form, of the ST to which they are connected.

Inside the MHS, users of the messaging are designated by their O/R name.

A match shall be therefore be made in the system, between the UDT's RFGI designation and the O/R name by which it is known by the MHS.

O/R names take the form 1, variant 1, as provided for in X.400:

Country/Administration Domain/Private Domain/Organisation/Person

The transformation between an system address and an O/R name is a local function of the HRSW UA. It takes place according to two simple criteria:

- the R value corresponds to the "Organisation Name" field;
- the complete RFGI address corresponds to the "surname" field of the "personal name".

For the system, the O/R name takes the form (for more details see annex E):

- Country/Public Domain/system domain/(R)/(RFGI).

The country, public domain and system domain are defined in annex E. The brackets shall determine information specific to a Regional Network.

The O/R name includes information which enables identification of a terminal's HRSW and routing messages addressed to it.

4.4.8. Routing

Inside the system private domain, routing shall be based on the "Organisation Name" attribute which contains the R value, identifying a regional network. Each system MTA must therefore have different R values.

Each RSW manages a single "Organisation Name", which is the R value of its regional network. All the RN users are associated to a single local UA.

The "Personal Name" attribute contains the RFGI value so that the UA can identify its users.

Routing within the management domain to which the system belongs is carried out directly:

- each originator HRSW identifies and accesses directly the recipient HRSW (no intermediary system MTA or X.400 MTA);
- information necessary to direct routing is found in originator's HRSW tables.

This information contains, among others, the identifier of the remote MTA, the called transport selector and the called X.25 network address.

Choosing direct access means that the X.400 routing configuration must be determined by the network operator. In the system, services management commands at the OMC enable:

- the identification of external subscribers;
- the correspondence of external subscribers with the information concerning the host X.400 MTA (an external subscriber is assigned to an X.400 MTA);
- the system offers the possibility to reroute messages addressed to an inaccessible X.400 MTA server by using the alternate server: see choice of configuration X.400-1.

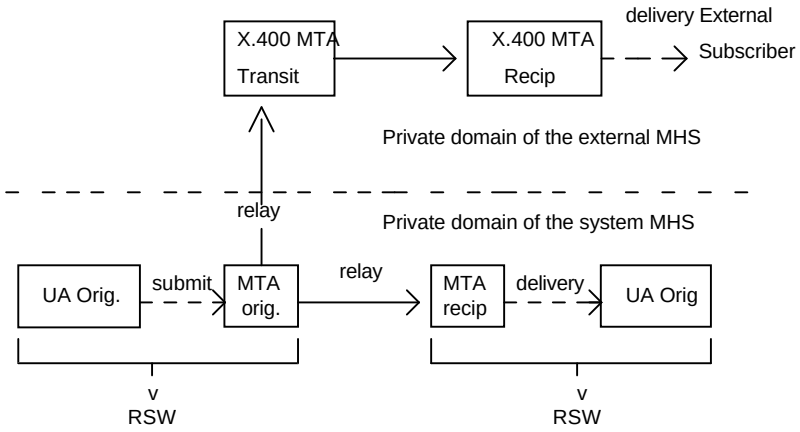
4.4.9. X.400 Relays

Definition of an X.400 relay: if the message submitted by the originator UA to the originator MTA is not addressed to one of the host UAs of the originator MTA, the latter opens a relay envelope and transmits it, with the contents of the message, to an adjacent MTA, establishing an association. If necessary, the second MTA relays the message by opening another relay envelope and transmitting it with the message contents to a new node, establishing a new association. This process is repeated from node to node until the message arrives at the recipient MTA.

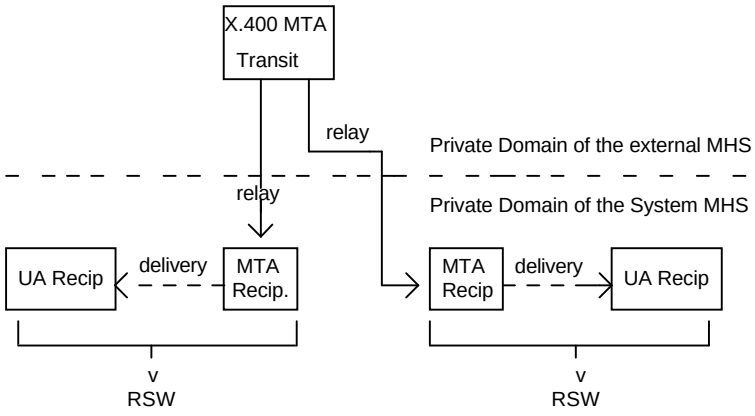
Application to the system:

A system MTA carries out a single relay with the recipient MTA: a system MTA is not a transit MTA. The X.400 MTA must access directly the recipient MTA of the system.

X.400 MTAs can be used as transit MTAs if the recipient X.400 MTA is not the host X.400 MTA of the system MTA.



1st case: System MTA is originator



2nd case: X.400 MTA is originator

Figure 7: X.400 relays

5. Description method

5.1. Classification of service elements

S: supported

The service provider makes the service element available to the service user.

N: non supported

The service provider is not required to make the service element available to the service user. However, the service provider should not regard the occurrence of the corresponding protocol elements as an error.

NA: not applicable

The service element is not applicable to this particular case (for the originator or for the recipient).

N/S: supported by the system service provider and not supported by X.400 MTA

For each service element a distinction will be made between its origination class (O) and its reception class (R).

For a service to be provided, the service element must be supported:

- in transmission with the originator entity;
- in reception with the recipient entity.

5.2. Classification of protocol elements

X: not supported

The protocol element is not generated; if it is received, its processing is not guaranteed in the recipient entity ;if it is requested, and the corresponding processing is specified in the X.400 implementation, this will be executed in violation of the profile defined here.

H: supported

The protocol element may be generated. If it is received, the recipient entity must carry out the corresponding processing.

G: generatable

The protocol element must be generated if requested. The recipient entity must carry out the corresponding processing.

M: mandatory

The protocol element is mandatory in all the message protocol data units (MPDUs). Absence is a protocol violation.

6. Message transfer service elements

Inside the private domain, an MTA must support all the basic services, except elements corresponding to coding and some submission/delivery service elements.

An exhaustive list of the services defined by X.400 is given in the following table, with the classification used for the system profile at origination (O) and reception (R).

Included notably are:

- delivery notification supported;
- non-delivery notification supported;
- no return of contents in the non-delivery notification;
- no deferred delivery.

The following table mentions the service elements defined for the profile of document PAS 001-13-1 [2]. The classification used is that of ENV41201 [9] as, in fact, no classification is carried out in PAS 001-13-1 [2] for P1 service elements.

Any service not mentioned in this table must be considered as not applicable.

Table 1: MTA Service elements

Service group	MTA Service Elements	0	R
Basic service	Non-delivery notification	S	NA
	Access management	N	N
	Message identification	S	S
	congested indication	NA	N
	Submission time stamp Indication	S	S
	Delivery time stamp Indication	NA	S
	Original Encoded Information types Indication	N	N
	Content Type Indication	S	S
	Registered Encoded Information Types	NA	N
Submission and Delivery	Deferred Delivery Cancellation	N	NA
	Delivery Notification	S	NA
	Grade of Delivery Selection	S	S
	Alternate Recipient Allowed	N	NA
	Disclosure of Other Recipients	N	N
	Prevention of Non-Delivery Notification	N	NA
	Multi-destination Delivery	S	NA
	Deferred Delivery	N	NA
	Return of Contents	N	NA
Conversion	Explicit Conversion	N	NA
	Implicit Conversion	N	NA
	Conversion Prohibition	N	N
Service Group	MTS Service Elements	O	R
Interrogation	Probe	N	NA
Status and Information	Old for Delivery	NA	N
	Alternate Recipient Assignment	NA	N

7. Message transfer protocol elements (P1)

An exhaustive list of X.411 protocol elements is given in the following table with the classification used.

The MPDU P1 messaging protocol elements are:

- User-MPDU: processed;
- Delivery-Report-MPDU Info not delivered: processed;
    - Delivery-Report-MPDU Info delivered: processed;
    - Probe-MPDU: not processed.

Table 2: Protocol elements (P1)

P1 Protocol Elements	Class	Restrictions and Comments
MPDU		
UserMPDU	G	UMPDU generated for message transfer
Delivery ReportMPDU	G	SMPDU-DR generated
ProbeMPDU	X	
UserMPDU		
UMPDUenvelope	M	
UMPDUcontent	M	
UMPDUenvelope		
MPDUIdentifier	M	Identifies message submission
originator (O/R names)	M	
original Encoded Information Types	X	
Content Type	M	P2 = 2 identifies the IPM protocol
UA Content ID	G	Provided by the UA max 16 characters see note 1
Priority	G	see note 2
PerMessageFlag	X	
Deferred Delivery	X	
PerDomainBilateralInfo	X	
RecipientInfo	M	see note 3
Trace Information	M	
Latest delivery (time)	X	
internal trace info	X	

NOTE 1: The system gives the same value in the IP-Message-ID field (printable string of the field contained in the P2 header) and in the UA-Content-ID field (P1 header). In case of delivery or non-delivery, this value will be returned in the UA-Content-ID component of the Delivery Report envelope (SMPDU-DR): correlation is thus made between the Non-Delivery Notification and the Message Identifier

NOTE 2: Correspondence between system (S) priorities and X.411 (X) priorities:

FLASH(S) = URGENT(X)
URGENT(S)= NORMAL(X)
ROUTINE(S)= NON URGENT(X)

The priority field is present even if the delivery grade is equal to normal.

NOTE 3: The maximum number of P1 recipient is limited to 8 for X.400 MTA server. This restriction is not available for the MTA of the system.

Table 2: Protocol elements (continued)

P1 Protocol Elements	Class	Restrictions and Comments
MPDUContent	M	
MPDUIdentifier		
GlobalDomain Identifier	M	
IA5 String	M	Generated by the MTA to identify the message in MTS (32 char.max)
GlobalDomainIdentifier		
CountryName	M	
AdministrationDomainName	M	
PrivateDomaineIdentifier	M	
RecipientInfo		
recipient (O/R name)	M	defined in annex E
ExtensionIdentifier	M	number which identifies a copy of original UMPDU
perRecipientFlag	M	type of report requested
ExplicitConversion	X	
originator requested-alternate recipient	X	
reassignment info	X	
perRecipientFlag		see note 1
management message ind.	M	
type of report requested	M	
type of report requested by the user	M	
type of report requested		
normal	M	delivery report in case of non-delivery
with confirmation	G	delivery report generated on request
with confirmation and trace	X	

NOTE 1: This Flag takes the following values:

0	0	0	0	1	0	1	X

If the Non-Delivery Notification alone is requested

0	0	0	1	0	1	0	X

If the Delivery Notification is also requested

Table 2: Protocol elements (continued)

P1 Protocol Elements	Class	Restrictions and Comments
TraceInformation		
GlobalDomainIdentifier	M	
DomainSuppliedInfo	M	
DomainSuppliedInfo		
arrival	M	submission date and time
deferred	X	
action	M	see note 1
relayed	G	
rerouted	G	
recipient reassign	X	
ConvertedEncodedTypes	X	
PreviousGlobalDomainIdentifier	X	
O/RName		form 1 variant 1
StandardAttributList	M	
DomaineDefinedAttributList	X	

NOTE 1: The value of the action field is "relayed" (value 0) in standard cases. There is no rerouting between system MTAs. The value of the action field is "re-rerouted" when the system MTA sends the MPDU to the standby server of the X.400 MTA which is inaccessible (if alternate server is available in external MHS).

Table 2: Protocol elements (continued)

P1 Protocol Elements	Class	Restrictions and Comments
StandardAttributeList		
CountryName	M	Defined in annex E: 3 char. maximum
AdministrationDomainName	M	Defined in annex E: 16 char. maximum
X12Address	X	15 char. maximum
Terminal ID	X	24 char. maximum
Private Domain Name	M	defined in annex E: 16 char. maximum
OrganisationName	M	(R): 64 char. maximum
UniqueUAIdentifier	X	32 char. maximum
PersonalName	M	
OrganisationalUnit	X	32 char. maximum
PersonalName		
SurName	M	(RFGI): 40 char. maximum
givenName	X	16 char. maximum
initials	X	5 char. maximum
generationQualifier	X	3 char. maximum
DeliveryReportMPDU		
DeliveryReportEnvelope	M	
DeliveryReportContent	M	
DeliveryReportEnvelope		information for routing the report to the originator
report	M	DR-MPDU Identifier
originator (O/R Name)	M	
TraceInformation	M	traces the path of the DR-MPDU
internal trace info	X	

The length inside the parenthesis are the value described in ENV41201 [9].

Table 2: Protocol elements (continued)

P1 Protocol Elements	Class	Restrictions and Comments
DeliveryReportContent		system information
original (Identifier)	M	UMPDU Identifier
TraceInfoIntermediate	X	
UA - Content - ID	G	always present in a Delivery Report to the system (see note 1)
ReportedRecipientInfo	M	
returned	x	no return of contents
billingInformation	X	
ReportedRecipientInfo		
recipient (O/R name)	M	
ExtensionIdentifier	M	identifies the UMPDU copy
PerRecipientFlag	M	report type requested by the originator
LastTraceInformation	M	status of non-delivered message
intentedRecipient	X	
SupplementaryInfo	X	
LastTraceInformation		
arrival	M	
converted encoded types	X	
report	M	

NOTE 1: This component is identical to the UA-Content-ID of the envelope of the UMPDU which is the object of this delivery report

Table 2: Protocol elements (continued)

P1 Protocol Elements	Class	Restrictions and Comments
Report		
DeliveredInfo	X	
NonDeliveredInfo	M	
DeliveredInfo		
Delivery	M	delivery date and time of the message to the UA recipient
UA Type	H	Private UA = 1
NonDeliveredInfo		
Reason Code	M	
Diagnostic Code	H	
UA profile identifier	X	
Arrival		
UTC-Hour	M	

The addressing plan of the external MHS is defined in annex E.

8. User agent service elements P2

Inside a private domain a UA must support all the basic services (P1 basic service element).

An exhaustive list of services defined by X.400 is given in the table below, with the classification used for the system profile at origination (O) and reception (R).

Included notably are:

- non-delivery report: supported;
- delivery report: not supported;

- receipt notification: not supported;
- non-receipt notification: not supported;
- IP message identification: supported.

The following table mentions the service elements defined for the profile in ITU-T X.224 [3]. The classification used is the same as in ENV 41201 [9], in fact, no classification is carried out in ITU-T X.224 [3] for P2 service elements.

The profile defined in PAS 0001-15-2 [10] proposes new services which are not defined in ITU-Ts X.400 to X.430 [7]: these services are listed together at the end of the table and are not applicable for origination and reception.

Any service that is not specified in this table must be considered not applicable.

Table 3: Service group and service elements

Service Group	UA Service Elements	O	R
Basic	"P1 basic service elements" IP message Identification Body type Indication	S S S	S S S
Submission and Delivery	"P1 Submission and Delivery service elements"	S	S
Conversion	"P1 conversion service elements"	N	N
Action between UAs Of cooperating IPMs	Non-receipt Notification Receipt Notification Blind Copy Recipient Indication Auto-forwarded Indication	N N N N	N N N N
Forwarding information between UA of cooperating IPMs	Multi-part body Obsoleting Indication Body part Encryption Indication Reply Request Indication Expiry Date Indication originator Indication Inportance Indication Subject Indication Replying IP-Message Indication Sensitivity Indication	N N N N N N N N N N	N N N N N N N N N N
Service Group	UA Service Elements	O	R
	Cross referencing indication Forwarded IP-Message indication Primary and Copy Recipients Indication Transmission Visa Indication	N N S N	N N S N
Interrogation	Probe	N	NA
Status and Information	"P1 Status and Information service elements"	NA	N
Other services	message circulation time obsoleting indication	NA NA	NA NA

9. User agent protocol elements (P2)

An exhaustive list of X.420 protocol elements is given in the following table (with the classification used).

P2 messaging protocol elements are:

- IM-UAPDU: processed;
- SR-UAPDU: processed.

Table 4: Protocol elements (P2)

P2 Protocol Elements	Class	Restrictions and Comments
UAPDU		
IM-UAPDU	G	generated to transfer IP messages
SR-UAPDU	X	no receipt notification, nor non receipt notification
IM-UAPDU		
header	M	
body	M	
Header		
IP-message-ID	M	message identifier: printable string
originator	X	
visas-origination	X	
PrimaryRecipients	M	list of Recipients
Copy Recipients	X	
BlindCopyRecipients	X	
in reply to	X	
cancel	X	
reference	X	
subject	X	
Expiry-Date	X	
Reply before	X	
reply to Users	X	
importance	X	
Sensitivity level	X	
auto-forwarded	X	
circulation list	X	
obsoleting	X	
recipient		
O/R descriptor	M	
Report request	X	no receipt notification, nor non-receipt notification requested
Reply request	X	
0/R descriptor	M	see note 1
O/R Name	M	
Free Form Name	X	
Telephone number	X	
IP-message-Id		
O/R name	X	
printable string	M	64 characters maximum, according to A/311
body		
body part	M	see note 2
body part		
IA5 text	G	
TLX	X	
voice	X	
G3-Fax	X	

NOTE 1 The number of P2 recipient is limited to 8 (system or external MHS)

NOTE 2 The restriction on the length body part is precised in PAS 0001-13-[2].

Table 4: Protocol elements (continued)

P2 Protocol Elements	Class	Restrictions and Comments
Tif.0	X	
TTX	X	
Videotex	X	
Nationally defined	G	
encrypted	X	
Forwarded IP-message	X	
SFD	X	
TIF.1	X	
ODA	X	
Nationally defined		defined as private according to ARCHITEL/ATLAS description
octet string	M	allow the transmission of private coding

10. Reliable transfer service elements

An exhaustive list of the services defined by X.410 is given in the following table, with the classification used for the system profile at origination (O) and at reception (R).

Table 5: Service elements (RTS)

RTS Service Elements	O	R
asssociation established	S	S
association terminated	S	S
request to change turn	N	N
change turn	N	N
data transfer	S	S
exeception report	S*	S*

S*:

- The RTS of the system RSW ever send an exception report request;
- On receipt of an exception indication, the RSW's RTS releases the corresponding association;
- If the RSW's RTS detects a local system incident, or if it receives a EXCEPTION INDICATION, it cuts the session connection by sending out a USER ABORT REQUEST.

11. Reliable transfer protocol elements

An exhaustive list of X.410 protocol elements is given in the following table, with the classification used.

Use of the OSI session by the RTS of the system RSW has the following characteristics:

- unidirectional association only;
- a RTS association corresponds to a single connection session;
- establishment and release of associations on request;
- maximum number of simultaneous associations limited by configuration;
- no check management.

an SESSION INTERRUPT ACTIVITY INDICATION is processed as an SESSION DISCARD ACTIVITY INDICATION

The profile of the OSI session is defined in PAS 0001-11 [6] and subclause 4.3.

Table 6: RTS Protocol elements (Transfer Protocol)

RTS Protocol Elements	Class	Restrictions and Comments
Presentation-Connection	G	"UserData" parameter of the SESSION CONNECT REQUEST
Data Transfer Syntax	M	X.409 =0
PUser Data-cr	M	
PUser Data-cr		
CheckPointSize	H	= 16 no minor synchronise although the corresponding Functional Unit was negotiated (RSW originator) defined in annex E for X.400 MTA originator
windowSize	H	=1
dialogueMode	H	unidirectional =0 (default)
ConnectionData	M	
applicationProtocol	H	P1 = 1 (by default)
ConnectionData		
OpenUserData	M	used when establishing an association
recoverUserData	X	
OpenUserData		
RTS UserData	M	
RTS UserData		
NULL	G	if no validation is requested
MTAName	H	} } choice of configuration
Password	H	} see note 1

NOTE 1: Not used by the RSW, use by the X.400 MTA is precised in annex E

Table 7: RTS Protocol elements (continued)

RTS Protocol Elements	Class	Restrictions and Comments
Presentation-Accept	G	"UserData" parameter of the REPLY TO CONNECTION REQUEST
Data Transfer Syntax	M	X.409 =0
PUserData-ac	M	
PUserData-ac		
CheckPointSize	H	= 16 for RSW-RSW connections = precised in annex E for X.400 MTA-RSW connections
WindowSize	H	= 1
ConnectionData	M	
Presentation-Refuse	G	"UserData" parameter of REPLY TO CONNECTION REQUEST
RefuseReason	M	
AbortInformation	G	"UserData" parameter of USER ABORT REQUEST
abort Reason	H	
parameter reflected	X	

12. Transfer presentation syntax and notation

The X.409 Recommendation must be supported entirely without any restriction.

13. Time format

The date and time parameter format conforms to the definition provided in X.408 and X.409.

For the system, this format is a character string that gives:

- local time;
- the difference between local time and UTC time.

The string's format is:

YYMMDDhhmmss*xxyy

YYMMDD : year/month/day

hhmmss : local time (to the second)

* : represents the + or - sign depending on the difference

xxyy : value of the difference with UTC expressed in hours and minutes

Annex A (normative): Correspondences between the fields of the SDP format

Correspondences between the fields of the SDP format of system messaging and X.400 Protocol elements (Protocol Layer 5-6).

A.1 Message identifier

In the SDP header, the IDMESSAGE identifier is formed by the following fields:

TTD : indication of transmitter type;
ORD : order number provided by the UA;
JOU : day of the month;
MOI : month in the year;
PMS : message priority.

The X.400 identifier of the message contained in IP_Message_ID (part IA5 string, maximum size 64 characters) is given by the system UA to the MTA during the submission request.

The X.400 identifier provided by the system UA is therefore composed of a maximum of 11 characters:

TTD (1 character);
JOU (2 characters);
MOI (2 characters);
PMS (1 characters);
ORD (1 to 5 characters).

The X.400 identifier of the message provided by an external MHS and contained in IP_Message_ID, is transmitted as it is to in the IDMESSAGE field to the UDT (see description in annex E.

A.2 Recipients list

In X.400, the recipients list is found in the "primary recipients" protocol element of the P2 header.

In the SDP PAS 0001-13-1 [2], the recipients list, as entered by the originator, is contained in the NADESTi field.

A.3 Other field

The "Surname" of the O/R originator Person Name, transported by P1, is contained in the NAEXP field.

The list of actual recipients corresponds to the "Surname" of the O/R recipient Person Name, transported by P1.

The submission date of the message transported to the "arrival" field of the "DomainSupplied Info" component corresponds to the SDP GDH_DEPOT field.

Annex B (normative): Non delivery notification (NDN) generation Criteria

B.1 MTA Criteria for the generation of NDN

X.400 delivery is made by the recipient MTA to its UA. This transaction does not imply the reception of the message by the recipient terminal, as this operation is the responsibility of the UA.

A part from problems related to the structure of the message and its envelope (these are usually detected on submission), the main following criteria determine non-delivery of a message:

- the recipient MTA is inaccessible after several retries (the link between the two MTAs is broken);
- the recipient MTA is unreacheable after several retries (parameters are unavailable: X.25 network address);
- the message threshold time (managed by the MTA according to the message's priority) has come to an end.

When one of these events occurs, the MTA stops processing the message and generates an NDN for the originator. The message is then deleted from the disk.

In the RSW software, the two criteria below are configured:

- The number of connect retries to a remote MTA and the interval between two retries are subject to two different parameters;
- The threshold time of a message is a function of its priority: four parameters allow URGENT, NORMAL and NON URGENT message (X.400 priorities) and notification threshold times to be determined independently.

During normal operations:

If the connection time with a remote MTA is less that the message threshold time, this latter never expires in the originator MTA during normal operations: it is always the failure to connect to a remote MTA that causes a message to be abandoned and the generation of an Non Delivery Notification.

In the case of a double breakdown (see details in PAS 0001-1 [1]), lifetime in transmission and reception can expire and cause an non delivery notification to be sent to the originator.

B.2 UA Criteria for the generation of requested NDN

The system software authorises the UA to send acknowledgements. These acknowledgements transmitted by the UA to the MTA are then transformed by the MTA into a Delivery or Non Delivery Notification.

The system UA sends a negative acknowledgement in the following cases:

- the number of P2 recipients is greater than 8;
- the number of P1 recipients (for X.400 MTA) is greater than 8;
- the message length (SDP format defined in PAS 0001-13-1 [2] is greater than LGEPDR,and smaller than the length of descriptor (10 ko);
- the message is erased in the queue of message for the back-up terminal in case of saturation (see PAS 0001-1 [1]);
- a "Surname" field among the system P1 recipients Person Name is unkown in the system (RFGI address).

This behaviour is not defined in X.400 standard. The generation of these notifications is different from the receipt notifications defined in X.400.

In some cases, the UA can not generate an DFN.

The message is then rejected to the garbage message collector (See definition PAS 0001-1[1]):

- P1 originator unexploitable;
- P1 recipient unexploitable;
- message transit by file. The length of this message (header and body) is greater than 10 Kbytes.

Annex C (informative): Parameters configuration (Protocol Layer 5-6)

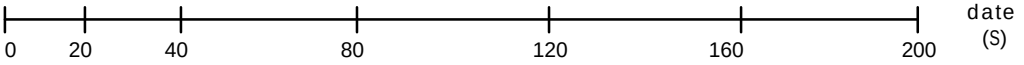
C.1 Parameter values in the RSW

C.1.1 Connection time to a remote MTA

A remote MTA is declared inaccessible after the failure of several retries spread over 3 mn 20 s. The Non Delivery Notification is sent to the originator when this time has elapsed.

This value is compatible with the time-out of an originator UDT (about 15mn), which considers the message to have been delivered if no Non Delivery Notification is received and no Delivery Notification is requested.

There are several retries:



C.1.2 Messages threshold time

For messages in transmission or reception, the system adopts the values defined in European Profiles:

- 4h00 for an urgent message;
- 24h00 for a normal message;
- 36h00 for a non urgent message;
- 4h00 for a notification.

These values are greater than the length of connection time to a remote MTA. They can be used to control the lifetime of messages by the recipient MTA.

C.1.3 Number of simultaneous association

The RSW can manage simultaneously 20 associations:

- 8 outgoing associations;
- 12 incoming associations.

C.2 Parameter values in X.400 MTA

See annex E.

C.3 Consequences

Threshold time of messages and notifications are chosen so that they never expire during normal operations.

In the event of a connection failure with a remote MTA:

* the RSW sends an NDN to the originator UDT or EDT after 3 mn 20s.

In the event of a double breakdown: the originator or recipient MTA sends an non delivery notification when the message threshold time end has been reached (see PAS 0001-1 [1] clause on inter-personal messaging).

Annex D (normative): Summary table of parameters for each layer 4 and 5

D.1 Recapitulation Table of TPDUs sent and received in class 2

Table D.1: TPDUs (class 2)

T P D U	Abb.	RSW	
		O	R
Connect Request	CR	Y	Y
Connection Confirmation	CC	Y	Y
Disconnect Request	DR	Y	Y
Disconnect Confirmation	DC	Y	Y
Data	DT	Y	Y
Data Acknowledge	AK	Y	Y
Expedited Data	ED	N	N
Expedited Acknowledge	EA	N	N
TPDU error	ER	Y	Y

Y for the X.400 session

D.2 Transport parameters of the X.400 session

Table D.2: Transport parameters (X.400 session)

Transport parameters of the X.400 session Preferred class	2	RSW-RSW connections RSW-MTA.400: defined in (annex E)
Multiplexing	yes	max number parametrable connection (configuration)
n T cn on 1 N cn	yes	parametrable: configuration in RSW: 5 configuration in X.400 MTA: see annex E
1 s cn on 1 T cn	yes	implicit
error detection	no	
concatenation/separation (n TPDU = 1 NSDU)	yes	basic (class 2)
segmenting/reassembling (1 TSDU = n TPDU)	yes	basic in all classes
transport identifier	yes	RSW config (no user access)
TSDU limitation	no	
splitting/recombining	no	because class 2
additional options	no	no transport expedited data
initial credit	7	depends on the size of the quantum allocation (RSW configuration) X.400 MTA configuration: see (annex E)
alternative class	0	
extended format	no	RSW implementation choice
explicit flow control	yes	RSW implementation choice
system TSAP		TSAPAX.400 for X.400 connection
X.400 MTA TSAP		Defined in annex E
TPDU size	1024	RSW configuration RSW-X.400 MTA: defined in annex E
Version number	1	Default value uncoded field

D.3 Summary table of SPDUs sent and received for an X.400 session

Table D.3: SPDUs (X 400 session)

S P D U	Abb.	RSW	
		E	R
Connect	CN	Y	Y
Accept	AC	Y	Y
Refuse	RF	Y	Y
Finish	FN	Y	Y
Disconnect	DN	Y	Y
abort	AB	Y	Y
abort accept	AA	Y	Y
Prepare	PR	N	N
Data Transfer	DT	Y	Y
Give Tokens	GT	Y1	Y1
Please Tokens	PT	Y1	Y1
Minor synchronise Point	MIP	N2	N2
Minor synchronise Acknowledge	MIA	N2	N2
Exception Report	ER	Y	Y
Exception Data	ED	N	Y

"1": "base concatenated" with a Category 2 SPDU only; in other words: LI of SPDU-GT or of SPDU-PT = 0

"2": will be managed when X.400 messages become significantly long

Table D.3: SPDUs (continued)

S P D U X.400 session (cont.)	Abb.	RSW	
		E	R
Activity start	AS	Y	Y
Activity Resume	AR	N	N
Activity Interrupt	AI	N	N
Activity Interrupt Ack	AIA	N	N
ActivityDiscard	AD	Y	Y
Activity Discard Ack	ADA	Y	Y
Activity End	AE	Y	Y
Activity End Ack	AEA	Y	Y
Give Tokens Confirm	GTC	N	N
Give Tokens Ack	GTA	N	N

D.4 Parameters of the X.400 session (RSW-RSW and RSW-X.400 MTA)

Table D.4: X.400 session parameters

Functional units	Kernel Half duplex activity exception minor synchronise	
Connect Identifier		X.410 RTS
Calling user ref.	SSAP address = TSAP address	coded in X409
common ref.	UTC time	
Additional info.	no	
Connect/Accept Item.	param absent	default values
protocol options	no extented concatenation	
TSDU size	= 0 by default	no segmenting
version number	= 1 by default	
initial serial number	not used by X.410	
token setting	to calling party	
Calling SSAP Identifier	parm absent	forbidden by X.410
Called SSAP Identifier	parm absent	forbidden by X.410
User data	yes	coded according to X.410
User requirements		
half-duplex	yes	Y/N
duplex	no	Y/N
expedited data	no	Y/N
minor synchronise	yes	Y/N
major synchronise	no	Y/N
resynchronise	no	Non Architel (no coded)
activity management	Yes	Y/N
negotiated release	no	Non Architel (no coded)
capability data exchange	no	O/N
exceptions	yes	for RTS
typed data	no	O/N

Annex E.(informative):X.400 External Interface Specification

This annex gives for the different X.400 interface layers the parameters which have to be specified by the system User including the name of the external MHS and the name of the X.25 Network.

E.1 X.400 MTA Transport parameters

These parameters are defined in the Connection Transport (CR or CC):
- TSAP;
- Credit.

These parameters are precised in the Connection Request TPDU (to be defined by the system user): the X.400 MTA is the originator of the connection.

- Preferred transport class;
- Alternative transport class;
- TPDU size proposed;
- Multiplexing (number of Transport Connection on a Network Connection).

These parameters are defined precised in the Connection Confirm TPDU (to be defined by the system user): the RSW is the originator of the connections.

- Preferred transport class.
- TPDU size negotiated.
- Negotiated transport class.

E.2 X.400 MTA Session parameters

Inactivity timer to close the session connection (RTS initiator):

To be defined by the system user.

E.3 X.400 MTA RTS parameters

The use of the name and password for an X.400 MTA must be precised by the system user. These parameters are used in RTS user data field of a Presentation Connection:

- X.400 MTA name;
- X.400 MTA password.

The following items are precised in Presentation Connection when an X.400 MTA is the originator of the RTS connection:

- Check Point size proposed;
- Windows size proposed.

The following items are precised in Presentation Accept when an X.400 MTA is the recipient of the RTS connection:

- Check Point size negotiated;
- Windows size negotiated;
- in Presentation Accept.

E.4 X.400 MTA MTS parameters

The Standard attribute List of the O/R Name structure is composed of the following fields:

- Country;
- Administrative Domain;
- X121 Address;
- Terminal ID;
- Private Domain;
- Organisation Name;
- Unique UA Identifier;
- Personal Name:
  - Surname;
  - Given Name;
  - Initial;
  - Qualifier;
- Organisation Unit.

The system user must precised the fields used for external subscribers.

E.6 system MTS Parameters

The O/R Name of a system Terminal is composed of the following fields:

Country;
Administrative Domain;
Private Domain;
The system user must precised these fields.

E.7 X.400 MTA UA parameters

To be defined by the system user.

E.8 Configuration choices

This chapter precises the parameter value defined in the system:

Configuration X.400-1: alternate server.
To be defined by the system user.

Configuration X.400-2: number of simultaneous access to the external MHS.
To be defined by the system user.

E.9 Application Interface

E.9.1 system Limitations

Message length:

The maximum size of messages (header and body) processed by the system UA is LGEPDR (see PAS 00013-1-1 [2]) for the definition of LGEPDR and a description of the messages). The body of a message transmitted by a X.400 MTA server must take this limitation into account.

Number of recipients:

The number of P1 recipients must be from 1 to 8.
The number of P2 recipients must be from 1 to 8.

Recipient address types:

The addresses given by the external MHS to the system MHS are explicit or implicit addresses defined in the system addressing plan (see PAS 0001-1 [1]).

If one of these criteria is not respected, the system generates a non-delivery notification, which it sends to the message originator.

E.9.2 Functions

- Segmentation/Reassembly: If an external subscriber wishes to transmit messages larger than LGEPDR (value defined in PAS 00013-1-1 [2]), the UA of the external server has to segment the messages. The UDT recipient must then reassemble the messages received.

  If a UDT sends a message larger than LGEDR to an external subscriber, the UDT segments the messages larger than LGEPDR: the UA of the external server must reassemble the messages.

  During reassembly the recipient must take into account the fact that message sequentiality is not guaranteed by the system. As the messages are transmitted separately, the system does not guarantee total reception of the messages to the main recipient (case of "distribution secure" in inter-personal messaging).

- Message coding: The system offers the external MHS two types of message coding: IA5 coding and private coding. The system does not carry out transcoding.

  Message processing time: The external subscriber can consider that in a majority of cases, the processing of a message by the system is carried out in a maximum of 15 minutes. In the unlikely event of a double breakdown, the external subscriber might receive an Non Delivery Notification after the 15 minutes wait time-out (for a description of these cases see PAS 0001-1 [1]).

Annex F (informative):X.25 parameters (layer 1-3)

F.1 Specific characteristics

The purpose of this sub clause is to define the specific characteristics of the RX.25 for the system interconnection.

It applies to the TETRAPOL system of the system user.

The system user must precise the name of the X.25 network.

It is structured according to the different interface network layers.

Specific characteristics are described for each level.

This sub clause contains informations (bold and underlined) which must be specified by the system user.

F.2 Interface of levels 1 to 3

This chapter describes the characteristics of the RX.25.

F.3 Data link level parameters

Verification of:

Timer value T1 = 1600 ms

Number of bits in an I frame = 2104

Distinctive features of the RX.25:

To be defined by the system user.

F.4 Network level parameters

DCE timers:

T10 =
T11 =
T12 =
T13 =

To be defined by the system user.

Maximum number of virtual circuit:
To be defined by the system user.

The system user must define: the RX.25 addressing planand fix the sub-address for the RSW.

F.5 Configuration choices

This clause precises the configuration choices available in the system.

F.6 Configuration X.400-1: use of Closed User Group

To be defined by the system user.

In case of use, the system user must confirm:
the number of CUG:
the list of CUG:

History

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