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Publicly Available Specification

TETRAPOL Specifications
Part 15: Gateway to EDT;
SubPart 2:EDT Transport Session Protocol

Reference

Keywords

Tetrapol

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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

Part 8 Radio conformance tests

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Part 10 Inter System Interface

Part 11 Gateway to PABX, ISDN, PDN

Part 12 Network Management Centre interface

Part 13 User Data Terminal to System Terminal interface

Part 14 System Simulator

Part 15 Gateway to External Data Terminal

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Part 17 Guide to TETRAPOL features

Part 18 Base station to Radioswitch interface

Part 19 Stand Alone Dispatch Position interface

1. Scope

This sub-part defines the Layers 4 and 5 of the External Data Terminal EDT-RSW protocol at R10 reference point.

This sub-part also contains the profiles of layers 4 and 5 which are necessary for the interconnection of the External Data Terminal (EDT) with an RSW.

Layer 1 to 3 are described in sub-part 1 of part 15.

Interworking between the external MHS and the System MHS is not the subject of the standard.

EDT access to the System messaging services is the subject of a separate part which describes the SDP Submit/Delivery Protocol (PAS 0001-13-1) [2].

2. Normative References

This PAS incorporates by dated and undated reference, provisions from other applications. 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 revision 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 publication referred to applies.

[1] PAS 0001-4: "TETRAPOL Specifications; Data protocol Gateway to X400".

[2] PAS 0001-13-1: "TETRAPOL Specifications; UDT and ST interface; Submit/Delivery Protocol".

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

[4] ITU-T Recommendations X.224 | ISO 8073: "Open Systems Interconnection; Transport; Protocol specification".

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

3. Abbreviations

For the purposes of this PAS the following abbreviations apply:

BS	Base Station
BN	Base Network
DCE	Data Circuit Equipment
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
KMC	Key Management Center
LC	Logical Channel
MTA	Message Transfer Agent
O/R	Originator/Recipient
OSI	Open System Interconnection
P1	Message Transfer Protocol
P2	Interpersonal Messaging Protocol
PAS	Publicly Available Specification
PI	Protocol Identifier

PMR	Private Mobile Radiocommunications
PRMD	Private Management Domain
RSW	Radio Switch
RTS	Reliable Transfer Server
RX.25	X.25 network to which the RSW connects
SAP	Service Access Point
SDP	Submit/Delivery Protocol
SPDU	Session Protocol Data Unit
SSAP	Session Service Access Point
SSDU	Session Service Data Unit
ST	System Terminal
TPDU	Transport Protocol Data Unit
TSAP	Transport Service Access Point
TSDU	Transport Service Data Unit
UA	User Agent
UDT	User Data Terminal
UTC	Universal Time Coordinated
VC	Virtual Circuit
VRSW	Visited Radio Switch

4. Presentation of the interfaces

The hardware and logical connection interface of computer equipment which is external to a Base Network shall be called a Data Connection reference Point (DCP): R10 (see PAS 0001-1 [3] is the EDT-DCP with the RSW.

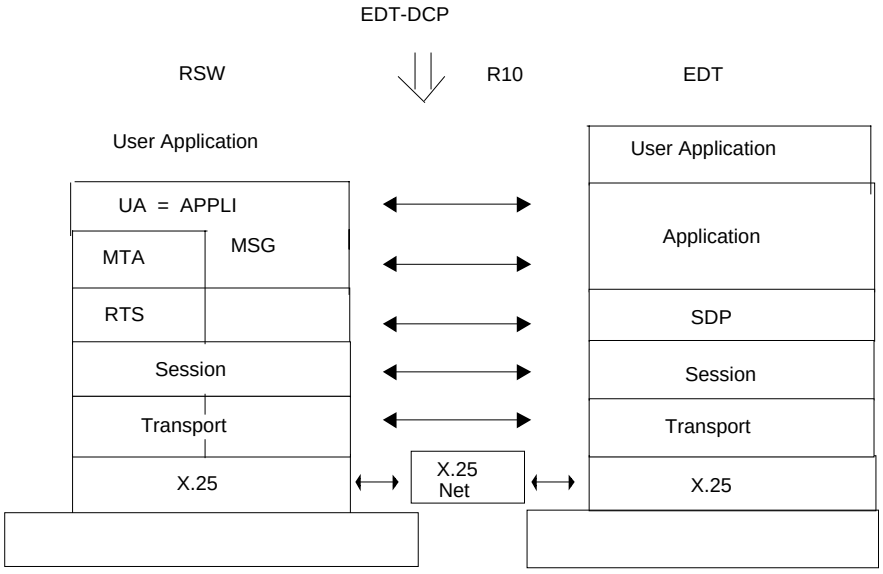

Figure 1: Protocol stacks

The interface between an RSW and external equipment EDT covers:

- the mode of connection to the X.25 network (layers 1 to 3) see subclause 1;
- the standardised transport and session protocols;
- submit/delivery protocol (SDP) for the EDT-DCP.

5. Layers 1 - 5 of the OSI model

Communications management provides a data exchange service.

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

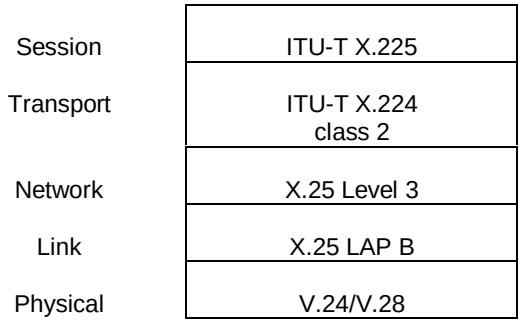

Figure 2: Communication layers

6. Transport layer

6.1 Presentation

The transport layer described here corresponds to the following application:

- Submit/Delivery Protocol (RSW to EDT).

6.2 Messaging Transport profile

The transport layer complies with the ITU-T Recommendations X.224 | ISO 8073 [4] 1984 edition and ITU-T Recommendations X.225 | ISO 8327 [5].

The transport class is class 2 for connections between EDT-RSW: with multiplexing, but without error detection.

Several transport connections can therefore be multiplexed on the same virtual circuit (in class 2).

The alternative transport class is class 0.

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.

6.3 Parameters used by the Transport layer

These parameters are 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 sending the TPDU CR.
- Transport class:

  preferred class = 2 for the RSW;

  alternative class = 0 for the RSW.
- Options:
  - use extended format = no;
- use of explicit flow control in class 2 = yes (zero status).
- ID of System TSAP:

  TSAPCGTDE for the SDP.
- ID of EDT TSAP: Precised in sub-part 1.
- TPDU size (proposed):

  1024 bytes is proposed by the RSW.
- 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 EDT-RSW connections: Precised in sub-part 1.
  - Chosen options:

    use of extended format = no;

    use of flow control = yes.
  - TPDU size:

    for EDT-RSW connections: Precised in sub-part 1;
- Additional options = no use of expedited data.

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

7. Session layer

7.1 Presentation

One session profile is used: session between RSW and EDT for the submit/delivery protocol.

The session complies with the ITU-T Recommendations X.224 | ISO 8073 [4] 1984 edition and ITU-T Recommendations X.225 | ISO 8327 [5].

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 Kbytes.

7.2 EDT Submit/Delivery protocol session

One session is established per type of messaging service between the RSW and the EDT on its Base Network (i.e. 4 sessions). These sessions remain permanently established (the EDT is always present and connected to the System).

All SDP protocol elements for Inter-Personal Messaging, External Application Messaging, and Regional Network Local Messaging and for the EDT's copy function are transported in these sessions.

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

7.2.1 Opening and closing an EDT session

Each bi-directional session is opened with the EDT, at the RSW's initiative:

- when the RSW is initialised;
- then periodically in case of failure at initialisation (the RSW time-out is set at 30s).

When this session is established, it is permanent.

The untimely session closing function (Abort session) can be called up by either extremity.

In this case, the RSW periodically attempts to re-establish the session, as at initialisation.

7.2.2 EDT session profile

A session identifier is used per application:

Calling SSAP Identifier:

- message Copy function : SAPCGCPY
- Inter-Personal Messaging function : SSAPCGMS
- External Application Messaging function : SSAPCGMD
- Regional Network Local Messaging function : SSAPCGML

Called SSAP Identifier for the:

- message Copy function;
- Inter-Personal Messaging function;
- External Application Messaging function;
- Regional Network Local Messaging function;

are precised in subclause 1 of this document.

Functional units chosen for each EDT session:

- Kernel;
- Full Duplex Transmission (In the "user requirements" field, only bit 2 is at 1).

List of SPDUs used: (KERNEL functional unit)

- establishing connection

  Connect : CN

  Accept : AC

  Refuse : RF

- active phase

  Data Transfer : DT

  Give Token : GT

  Disconnect : DN

  Finish : FN

  Abort : AB

  Abort Accept : AA

The SPDU-GT is only sent for basic concatenation with the SPDU-DT, envisaged in the X.225 standard. This does not mean that there is data token management in the chosen profile.

ANNEX A (normative): Summary table of parameters for each layer

Table 1: Recapitulation Table of TPDUs sent and received in class 2

T P D U	Abb.	RSW	
		O	R
Connect Request	CR	Y	N
Connection Confirmation	CC	N	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

Table 2: Transport parameters:

Preferred class	2	RSW-EDT
Multiplexing	yes	max number parametrable connection (configuration)
n T cn on 1 N cn	yes	parametrable: configuration in RSW: 5
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) EDT configuration: see in sub-part 1.
alternative class	0	
extended format	no	RSW implementation choice
explicit flow control	yes	RSW implementation choice
System TSAP		TSAPCGTDE
EDT TSAP		Defined in sub-part 1.
TPDU size		RSW-EDT: defined in sub-part 1.
Version number	1	Default value uncoded field

Table 3: Summary table of SPDUs sent and received for an EDT session

S P D U	Abb.	RSW	
		O	R
Connect	CN	Y	N
Accept	AC	N	Y
Refuse	RF	N	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	Y*	Y*

"*": "base concatenated" with an SPDU-DT

Table 4: EDT Session profile parameters:

Functional units	Kernel full duplex	
Connect Identifier		
Calling SS-user ref.	yes (transp)	In the RSW this information is coded in a buffer
common ref.	yes (transp)	associated with control block
Additional ref info.	yes (transp)	
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		no minor synchro
token setting	no token	control block parameter
Calling SSAP Identifier	SSAPCGMD SSAPCGML	copy function Inter-personal messaging
	SSAPCGMD SSAPCGML	EXAM messaging RN local messaging
Called SSAP Identifier		see sub-part 1
User data	param absent	
User requirements half-duplex duplex expedited data minor synchronise major synchronise resynchronise	 no yes no no no no	 associated with activity manage No Architel (no implemented)
activity management	no	
negotiated release	no	No Architel (no implemented)
capability data exchange exceptions typed data	no no no	

History

Document history		
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