PAS 0001-13-4 V1.0.0 (1997-06)

Publicly Available Specification

TETRAPOL Specifications
Part 13: UDTand ST interface;
SubPart 4: TCP-UDP/IP protocols

Reference

Keywords

Tetrapol

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Contents

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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 Interface to dispatch centre

Part 6 Line Connected Terminal interface

Part 7 Codec

Part 8 Radio conformance tests

Part 9 Air interface protocol conformance tests

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

Part 16 Security

Part 17 Guide to TETRAPOL features

Part 18 Base station to Radioswitch interface

Part 19 Stand Alone Dispatch Position interface

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1. Scope

The purpose of this part is to present the interface of the Internet Protocols which are used at the UDT-ST interface (reference point R2bis defined in PAS 0001-1-1[1]).

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 0001-1-1: "TETRAPOL Specifications;General Network Design; Reference Model".

[2] PAS 0001-11-3: "TETRAPOL Specifications; Gateway to External Network; Gateway to IP Network".

[3] PAS 0001-13-1: "TETRAPOL Specifications; UDT and ST interface; Overview of UDT architecture".

[4] RFC 768 (August 80): “User Datagram Protocol”, J. Postel.

[5] RFC 791 (September 81): “Internet Protocol”, J. Postel.

[6] RFC 792 (September 1981): “Internet Control Message Protocol”, J. Postel.

[7] RFC 919 (October 1984): “Broadcasting Internet datagrams”, J. Mogul.

[8] RFC 922 (October 1984): “Broadcasting Internet datagrams in the presence of subnets”, J. Mogul.

[9] RFC 1122 (October 1989): “Requirements for Internet hosts - communication layers”, R. Braden.

[10] RFC 1123 (October 1989): “Requirements for Internet hosts - application and support”, R. Braden.

[11] RFC 1812 (June 1995): “Requirements for IP version 4 routers”, F. Baker.

[12] RFC 1920 (March 1996): “Internet official protocol standards”, J. Postel.

3. Definitions and abbreviations

3.1. Definitions

Data Application Server (DAS): Functional entity in the external system managing IP applications. These applications are also located in the UDT. TETRAPOL SwMI provides IP transmission between UDTs and DASs.

Downlink message: Message transmitted by the SwMI to an ST, then to a UDT.

Uplink message: Message transmitted by a UDT to an ST, then to the SwMI.

3.2. Abbreviations

The abbreviations from PAS 0001-1-1 apply, as well as the following abbreviations:

ARP	Address Resolution Protocol
DAS	Data Application Server
ICMP	Internet Control Message Protocol
IP	Internet Protocol

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NDIS	Network Driver Interface Specification
OG	Operational Group
TCP	Transport Connected Protocol
UDP	User Data Protocol

4. TCP-UDP/IP protocol driver

This driver is a standard Internet software product offering on one hand the IP protocol family (IP, ICMP, ARP, etc...) and on the other hand the TCP protocol family (TCP, UDP). This driver shall lay on the Microsoft NDIS interface and provide a standard applicative interface. The most common applicative interface for Internet Protocols is the Socket Interface.

5. IP protocol

See PAS 0001-11-3 [2].

6. TCP-UDP protocol

6.1. TCP/UDP source port coding

The TETRAPOL system makes a specific use of this field, to identify the radio service over the air interface, the priority and encryption of the message. These are assigned by the UDT for the message transmission.

The Source Port format includes radio service, priority and encryption flag.

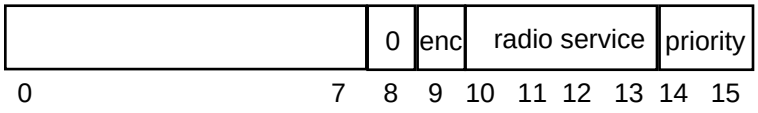

Figure 1: TCP/UDP source port coding

6.1.1. Priority of the message

See PAS 0001-11-3 [2].

6.1.2. Radio service

The radio service is assigned by the UDT for message transmission. It shall then be considered by the RT to submit the uplink message according to the relevant TETRAPOL protocols over the air interface. If the recipient is external to the system (one DAS), the SwMI routes the message to the external IP gateway. If the recipient is internal to the system (one or a group of UDT), the SwMI considers the source port to deliver the downlink message according to the relevant TETRAPOL protocols over the air interface.

To summarise, when the UDT transmits a message to a DAS, the UDT shall define the type of submission over the air interface; when the UDT transmits a message to a UDT or a OG (group of UDT), the UDT shall define both the type of submission and the type of delivery over the air interface.

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source port coding	radio submission
$b_{10}b_{11}b_{12}b_{13}$= 0000	standard connected packet submission
$b_{10}b_{11}b_{12}b_{13}$= 0100	fast connected packet submission
$b_{10}b_{11}b_{12}b_{13}$= 1111	datagram submission
$b_{10}b_{11}b_{12}b_{13}$= 1111	periodic datagram polling

Figure 2: Coding of radio service in the source port for a message from UDT to DAS

source port coding	radio submission + radio delivery
$b_{10}b_{11}b_{12}b_{13}$= 0000	standard connected packet submission **+** standard connected packet delivery
$b_{10}b_{11}b_{12}b_{13}$= 0001	standard connected packet submission + unannounced datagram delivery
$b_{10}b_{11}b_{12}b_{13}$= 0010	standard connected packet submission + announced datagram delivery
$b_{10}b_{11}b_{12}b_{13}$= 0100	fast connected packet submission + fast connected packet delivery
$b_{10}b_{11}b_{12}b_{13}$= 0101	fast connected packet submission + unannounced datagram delivery
$b_{10}b_{11}b_{12}b_{13}$= 0110	fast connected packet submission + announced datagram delivery
$b_{10}b_{11}b_{12}b_{13}$= 1101	datagram submission mode + unannounced datagram delivery
$b_{10}b_{11}b_{12}b_{13}$= 1110	datagram submission mode + announced datagram delivery
$b_{10}b_{11}b_{12}b_{13}$= 1111	datagram submission mode + multi-channel datagram delivery

Figure 3: Coding of radio service in the source port for a message from UDT to UDT or OG

6.1.3. Encryption of the message

See PAS 0001-11-3 [2].

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6.2. UDP datagram length

See PAS 0001-11-3 [2].

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History

Document history		
Date	**Status**	**Comment**
23 May 1997	Version 0.0.1	First version
3 June 1997	Version 0.1.0	Update after review
25 June 1997	Version 1.0.0	Tetrapol Forum Approval

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