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Terrestrial Trunked Radio (TETRA); Technical requirements specification for Digital
Advanced Wireless Service (DAWS)

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Foreword

This Technical Report (TR) has been produced by ETSI Project Terrestrial Trunked Radio (TETRA).

Introduction

The present document has been prepared (based upon the finalized work of EP-TETRA) as a communication to the ETSI Membership and Board and as a general working document for EP-TETRA Working Group 4 in the field of Mobile Networking.

The present document describes the basic ideas behind Digital Advanced Wireless Services (DAWS), relevant to market aspects and positioning within the present portfolio of ETSI Projects and Standardization activities.

Following the publication of the Strategic Review Committee (SRC6) Report on EII, June 1995 and the Global Multimedia Mobility (GMM) Report, October 1996 an ever increasing pace of activities within the field of Multimedia, Internetworking and 4th Generation Broadband technologies has been experienced throughout all three ITU Regions.

New approved ETSI Projects in this field are EP TIPHON, EP BRAN, and to some extent EP EASI. With formal liaison with the ATM Forum, ETSI is well prepared to meet the increasing pressure from the market to realign capacity and throughput of the wireless world with that of the fixed networks.

In order to be successful, both:

- 1) short time to market; and
- 2) careful forward migration of second generation Infrastructure,

have to be addressed.

Both these criteria lead to the initiative of building upon existing standards and already expended effort. Emergence of new generations should happen through evolution not revolution.

Well known examples are the current implementation of GPRS (General Packet Radio Services) onto the existing GSM platform to expand throughput and the reuse of GSM Protocol Architectures in the 1 800 and 1 900 MHz bands to expand capacity.

Likewise within EP TETRA a number of members (initially SIMOCO, TeleDanmark, BT, Motorola and UK Home Office), based on a study report decided to work on migrating the TETRA Packet Data Optimized (PDO) wireless networking standard (ETS 300 393 [1] to [3]) to provide full mobility/roaming and Wireless ATM bit rates up to 155 Mbit/s. This enhancement was given the code-name DAWS and has already been studied with much interest within the ATM Forum (Working Group WATM).

The cellular telephone users have been pampered with seamless on-line facilities and functions. Full mobility is essential for future hand-held "Wireless WEB-Surfers" offering continuous transmission of live pictures as well as Automatic Vehicle Location (AVL) and Automatic Person Location (APL).

In the early seventies, some forward-looking heads of laboratories within the old telephone monopolies of Europe proposed the addition of mobility to communication services, not realizing they were giving birth to one of the largest success stories of communications of this century, the digital cellular industry.

Now envisage a wireless hand-held WEB-Browsing device (a DAWS terminal) featuring the same mobility as a wireless phone service with throughput enough to process Wireless Packet Voice Telephony (The Mobile TIPHON-Phone) and other future "bit-hungry" applications.

Just as telephone subscribers were waiting to go unwired 25 years ago, the exploding Internet/Intranet community is still waiting for a solution which also satisfies the requirements of network operators. DAWS is a valuable addition to the current menu of ETSI Standardization activities.

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1 Scope

The present document is to inform ETSI Members how far the work on DAWS has progressed and to outline the market potential for seamless high data rate mobile services. A proposal for deliverables in this field and an assessment of the time to deliver is presented later in the present document.

The DAWS Standard, complying with the ETSI TA Decisions, will be divided into three parts:

- 1) network aspects including Wireless Node Interlink Protocol Specifications;
- 2) terminal Air-Interface, including layer 3 entities;
- 3) authentication, encryption and security aspects.

Current work has shown that major reuse of the ETS 300 393 [1] to [3] standard is feasible and highly recommended.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
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- <https://standards.iteh.ai/catalog/standards/sist/17680b2-18f0-4d92-987a-536001619f/psist-tr-101-156-2000>
- PSIST TR 101 156:2000
- [1] ETS 300 393-1: "Terrestrial Trunked Radio (TETRA); Packet Data Optimized (PDO); Part 1: General network design".
- [2] ETS 300 393-2: "Terrestrial Trunked Radio (TETRA); Packet Data Optimized (PDO); Part 2: Air Interface (AI)".
- [3] ETS 300 393-7: "Terrestrial Trunked Radio (TETRA); Packet Data Optimized (PDO); Part 7: Security".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

APL	Automatic Person Location
AVL	Automatic Vehicle Location
BS	Base Station
DAWS	Digital Advanced Wireless Services
EII	European Information Infrastructure
GMM	Global Multimedia Mobility
GPRS	General Packet Radio Services
GW	Gateway
IP	Internet Protocol
LLC	Logical Link Controller
MAC	Medium Access Controller
MS	Mobile Station
PDO	Packet Data Optimized
PHY	Physical Layer
SRC	Strategic Review Committee
SW	Switch
TRAC	Technical Regulations Applications Committee
WATM	Wireless Asynchronous Transfer Mode

4 Market Considerations

Today, over 100 million Internet connected computers are in daily operation, a number exceeding currently the world population of private TV-dish receivers. These fixed terminals are supported by more than 16 million servers - up from 1 000 back in 1988, according to Frost & Sullivan, 1997.

By the year 2000, MCI estimates that 200 million active Internet terminals will be in constant operation, a lucrative market trend for the development and operation of "Personal Seamless Internet Access" as well as offering a vehicle for the European Information Infrastructure (EII) Services.

As entertainment and information technology become more integrated it is also interesting to observe the market acceleration seen from the media side:

- in the US (see US Investment Bank) it took about:
 - 38 years for radio broadcasting to reach 50 million listeners;
 - 13 years for television to reach that same number of viewers;
 - 10 years for cable TV; and

by 1998 this number of active Internet users will be reached, just 5 years after its commercial roll-out.

According to Business Newspaper "Boersen", 5 % of all international telephony will be Internet based by the turn of the millennium. This means a total accessible market of more than 5 million potential users of wireless high capacity links, including telephony, is waiting to be served by the time the DAWS standard is completed.

The DAWS approach is in full compliance with the new ETSI initiative of bringing professional products to market faster. DAWS will reduce the technical risk involved in bringing the EII to fruition and it will further reduce spending for both ETSI and the European Union (EU).