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Contents

Foreword

This European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS is a multi-part standard and will consist of the following parts:

Part 1: "General network design".

Part 2: "Air Interface (AI)".

Part 3: "Inter-working", (DE/RES-06001-3).

Part 4: "Gateways", (DE/RES-06001-4).

Part 5: "Terminal equipment interface", (DE/RES-06001-5).

Part 6: "Line connected stations", (DE/RES-06001-6).

Part 7: "Security".

Part 8: "Management services", (DE/RES-06001-8).

Part 9: "Performance objectives", (DE/RES-06001-9).

Part 10: "Supplementary services stage 1".

Part 11: "Supplementary services stage 2", (DE/RES-06001-11).

Part 12: "Supplementary services stage 3", (DE/RES-06001-12).

Part 13: "SDL Model of the Air Interface", (DE/RES-06001-13).

Part 14: "PICS Proforma", (DE/RES-06001-14).

Part 15: "Inter-working - Extended Operations", (DE/RES-06001-15).

Part 16: "Gateways for Supplementary Services", (DE/RES-06001-16).

Transposition dates	
Date of adoption of this ETS:	1 March 1996
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1 Scope

This European Telecommunication Standard (ETS) defines the stage 1 specifications of the Supplementary Service Access Priority (SS-AP) for the Trans-European Trunked RAdio (TETRA). Stage 1 is an overall service description from the users point of view but does not deal with the details of the human interface itself.

This ETS specifies the service description of the supplementary service and the procedures to be expected with successful and unsuccessful outcomes. In addition this ETS specifies the interactions with other TETRA supplementary services and inter-working considerations.

Charging principles are outside the scope of this ETS.

The SS-AP enables a user to have preferential access to the TETRA system in times of radio link congestion.

2 Normative references

This ETS incorporates, by dated or 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 ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[2] ITU-T Recommendation Z.100 (1993): "Specification and Description Language (SDL)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

access control: The prevention of unauthorized use of resources, including the use of a resource in an unauthorized manner.

access priority level: A value allocated to each mobile ITSI or GTSI/call type. It is used at the initial call set-up attempt to determine priority access across the air interface to the control functional entities.

served user: The user making a request for service.

Switching and Management Infrastructure (SwMI): All of the TETRA equipment for a Voice plus Data (V+D) network except for subscriber terminals. The SwMI enables subscriber terminals to communicate with each other via the SwMI.

3.2 Abbreviations

3.2.1 General abbreviations

For the purposes of this ETS, the following general abbreviations apply:

GTSI	Group TETRA Subscriber Identity
ISDN	Integrated Services Digital Network
ITSI	Individual TETRA Subscriber Identity
MS	Mobile Station
SDL	(Functional) Specification and Description Language
SS	Supplementary Service

NOTE: The abbreviation SS is only used when referring to a specific supplementary service.

SwMI	Switching and Management Infrastructure
TETRA	Trans-European Trunked RAdio

3.2.2 Supplementary service abbreviations

For the purposes of this ETS, the following Supplementary Service abbreviations apply:

SS-AL	Ambience Listening
SS-AoC	Advice of Charge
SS-AP	Access Priority
APL	Access Priority Level
SS-AS	Area Selection
SS-BIC	Barring of Incoming Calls
SS-BOC	Barring of Outgoing Calls
SS-CAD	Call Authorized by Dispatcher
SS-CCBS	Call Completion to Busy Subscriber
SS-CCNR	Call Completion on No Reply
SS-CFB	Call Forwarding on Busy
SS-CFNRy	Call Forwarding on No Reply
SS-CFNRc	Call Forwarding on Not Reachable
SS-CFU	Call Forwarding Unconditional
SS-CLIP	Calling Line Identification Presentation
SS-CLIR	Calling/Connected Line Identification Restriction
SS-COLP	Connected Line Identification Presentation
SS-CR	Call Report
SS-CRT	Call Retention
SS-CW	Call Waiting
SS-DGNA	Dynamic Group Number Assignment
SS-DL	Discreet Listening
SS-HOLD	Call Hold
SS-IC	Include Call
SS-LE	Late Entry
SS-LSC	List Search Call
SS-PC	Priority Call
SS-PPC	Pre-emptive Priority Call
SDA	Short data Service
SS-SNA	Short Number Addressing
SS-TC	Transfer of Control
SS-TPI	Talking Party Identification

4 Supplementary Service Access Priority (SS-AP) stage 1 specification

4.1 Description

4.1.1 General description

SS-AP enables the user to gain access to the TETRA system in times of radio link congestion. Preferential treatment shall apply to the uplink access.

The Access Priority Level (APL) range is normally stored in the database within the Mobile Station (MS), and an APL is attached to the Layer 3 messages by the Layer 3 Control Entities when sending uplink messages. The APL should be examined by the Layer 2 Entities when making decisions to send the Layer 3 messages.

The APL range may be changed by the Switching and Management Infrastructure (SwMI) and the level used may be selected within the range by the served user.

The APL may be different depending upon the service required.

The network may store the value of the APL assigned to the Individual TETRA Subscriber Identity (ITSI) and/or Group TETRA Subscriber Identity (GTSI) and/or call types upon provision.

The SwMI should periodically broadcast information relating to those mobiles which have been given permission to make an uplink access attempt. Each mobile operating on the network should be assigned an APL by the network provider. In a typical scenario there may be eight access priority levels, each one in turn giving an enhanced performance in times of radio access congestion.

Under normal circumstances when there is no congestion, all mobiles shall be permitted to make access attempts to the SwMI. If the SwMI wishes to regulate random access attempts the SwMI should broadcast a change of APL. A user wishing to establish a call (or transfer information to the SwMI), under these circumstances, shall firstly compare the broadcast message with his/her own APL. If the user's APL is greater than or equal to the broadcast APL, then he/she shall be able to make an initial call set-up attempt. If the user's APL is less than the broadcast APL then he shall not be able to make an initial call set-up attempt at that time and shall wait until the network changes the APL.

4.1.2 Qualifications on applicability to telecommunication services

This supplementary service shall be applicable to all TETRA circuit mode teleservices, to all TETRA circuit mode bearer services, and to the Short Data Service (SDS).

4.2 Procedures

4.2.1 Provision and withdrawal

Provision and withdrawal of SS-AP shall be by pre-arrangement with the service provider.

SS-AP shall be on a per TETRA number (ITSI/GTSI) basis. For each ITSI/GTSI, the supplementary service may be provided by subscription for every basic service subscribed to at that ITSI/GTSI, or for only some of the basic services subscribed to at that ITSI/GTSI.

4.2.2 Normal procedures

4.2.2.1 Activation, deactivation, definition, registration, interrogation and cancellation

4.2.2.1.1 Activation and deactivation

SS-AP may be activated by the service provider upon provision and deactivated upon withdrawal. When activated the APL shall be stored within the MS and may be stored within the SwMI.

4.2.2.1.2 Definition

An authorized user may define the APL for the served user, (e.g. as a dispatcher operation, or as a result of the invocation of SS-Dynamic Group Number Addressing (SS-DGNA)).

4.2.2.1.3 Registration

The SwMI may support the registration of authorized users who may be allowed to carry out definition of the supplementary service for the served user. The registration process shall include the ITSI jurisdiction of the authorised user.

4.2.2.1.4 Interrogation

The SwMI may provide interrogation, which can be local, remote or both.

If local interrogation is provided, a SwMI shall support interrogation on a per number basis for:

- all TETRA teleservices and bearer services as defined previously; and/or
- a user specified basic service.

The SwMI response to an interrogation request shall provide the following information to the user:

- provided or not provided; and

- APL.

Remote interrogation may be possible by a special authorized user. The remote interrogation request and response shall include the information as specified for local interrogation.

4.2.2.1.5 Cancellation

Cancellation shall not be applicable.

4.2.2.2 Invocation and operation

The supplementary service shall be invoked by the SwMI as a result of the downlink broadcast message. The supplementary service shall remain invoked within each mobile as long as the service is activated within the MS.

In the instance where there is no congestion across the air interface, the served user's call shall be set up in the normal manner.

The SwMI shall periodically broadcast information relating to those mobiles which have been given permission to make an uplink access attempt.

When the uplink radio access resources have become congested, the SwMI may change the broadcasted access level message, depending upon the degree of congestion, or upon a pre-determined user/operator agreement, such as a minimum occupancy level.

A served user wishing to establish a call, normally selects a priority level for the call. The MS selects the corresponding APL and then compares it with the broadcast message. This shall be an automatic procedure carried out by the mobile. If the MS’s APL is greater than or equal to the broadcast APL, then the MS shall be able to make an initial call set-up attempt. If the MS’s APL is less than the broadcast APL then the MS shall not be able to make an initial call set-up attempt at that time and shall wait until the network changes the APL. An indication may be returned to the served user if access has been denied.

A user who has already established a connection when the broadcast APL changes shall not be affected in this manner.

4.2.3 Exceptional procedures

4.2.3.1 Activation, deactivation, definition, registration, interrogation and cancellation

4.2.3.1.1 Activation and deactivation

Exception procedures shall not apply.

4.2.3.1.2 Definition

An exceptional activation may occur when the authorised user tries to define a higher APL but has not subscribed to it. In such circumstances, the authorised user shall receive a notification that the activation has been disallowed and given the reason.

NOTE: The source of the notification is dependant on the implementation option. It is possible that the notification could be generated from the mobile or from the SwMI, depending upon which entity checks the allowed values.

4.2.3.1.3 Registration

Exceptional procedures for registration shall not apply.

4.2.3.1.4 Interrogation

If the SwMI cannot accept an interrogation request, the interrogating user shall receive a notification that SS-AP interrogation was unsuccessful. Possible causes for rejection can be:

- insufficient information;

- basic service to which relevance is requested, is not subscribed to.

4.2.3.1.5 Cancellation

Exceptional procedures for cancellation shall not apply.

4.2.4.1 Invocation and operation

An exceptional condition may arise when the MS attempts to make an initial call attempt without having the appropriate APL. In such circumstances the SwMI may reject the initial call attempt and the cause shall be returned to the served user.

4.3 Interactions with other supplementary services

Interactions with other TETRA supplementary services are specified in subclauses 4.3.1 to 4.3.30.

4.3.1 Calling Line Identification Presentation (SS-CLIP)

SS-AP shall not have any interaction with SS-CLIP.

4.3.2 Connected Line identification Presentation (SS-COLP)

SS-AP shall not have any interaction with SS-COLP.

4.3.3 Calling/Connected Line Identification Restriction (SS-CLIR)

SS-AP shall not have any interaction with SS-CLIR.

4.3.4 Call Report (SS-CR)

SS-AP shall not have any interaction with SS-CR.

4.3.5 Talking Party Identification (SS-TPI)

SS-AP shall not have any interaction with SS-TPI.

4.3.6 Call Forwarding Unconditional (SS-CFU)

SS-AP shall not have any interaction with SS-CFU.

4.3.7 Call Forwarding on Busy (SS-CFB)

SS-AP shall not have any interaction with SS-CFB.

4.3.8 Call Forwarding on No Reply (SS-CFNRy)

SS-AP shall not have any interaction with SS-CFNRy.

4.3.9 Call Forwarding on Not Reachable (SS-CFNRc)

SS-AP shall not have any interaction with SS-CFNRc.

4.3.10 List Search Call (SS-LSC)

SS-AP shall not have any interaction with SS-LSC.

4.3.11 Call Authorized by Dispatcher (SS-CAD)

SS-AP shall not have any interaction with SS-CAD.

4.3.12 Short Number Addressing (SS-SNA)

SS-AP shall not have any interaction with SS-SNA.

4.3.13 Area Selection (SS-AS)

SS-AP shall not have any interaction with SS-AS.

4.3.14 Access Priority (SS-AP)

Not applicable.

4.3.15 Priority Call (SS-PC)

SS-AP shall not have any interaction with SS-PC.

4.3.16 Call Waiting (SS-CW)

SS-AP shall not have any interaction with SS-CW.

4.3.17 Call Hold (SS-HOLD)

SS-AP shall not have any interaction with SS-HOLD.

4.3.18 Call Completion to Busy Subscriber (SS-CCBS)

SS-AP shall not have any interaction with SS-CCBS.

4.3.19 Late Entry (SS-LE)

SS-AP shall not have any interaction with SS-LE.

4.3.20 Transfer of Control (SS-TC)

SS-AP shall not have any interaction with SS-TC.

4.3.21 Pre-emptive Priority Call (SS-PPC)

SS-AP shall not have any interaction with SS-PPC and the PPC shall continue with the highest APL.

4.3.22 Include Call (SS-IC)

SS-AP shall not have any interaction with SS-IC.

4.3.23 Advice of Charge (SS-AoC)

SS-AP shall not have any interaction with SS-AoC.

4.3.24 Barring of Outgoing Calls (SS-BOC)

SS-AP shall not have any interaction with SS-BOC.

4.3.25 Barring of Incoming Calls (SS-BIC)

SS-AP shall not have any interaction with SS-BIC.

4.3.26 Discreet Listening (SS-DL)

SS-AP shall not have any interaction with SS-DL.

4.3.27 Ambience Listening (SS-AL)

SS-AP shall not have any interaction with SS-AL when it has been invoked by the dispatcher.

SS-AP shall not have any interaction with SS-AL when it has been self invoked.

4.3.28 Dynamic Group Number Assignment (DGNA)

If the served user has dynamically assigned a new group then the APL from the served user shall be downloaded to the members of the new group.

4.3.29 Call Completion on No Reply (SS-CCNR)

SS-AP shall not have any interaction with SS-CCNR.

4.3.30 Call Retention (SS-CRT)

SS-AP shall not have any interaction with SS-CRT.

4.4 Inter-working considerations

When the served user moves to another SwMI, he shall be informed of the existence of, or change to, his APL.

4.5 Overall SDL

Figures 1 and 2 contains the dynamic description of SS-AP using the Specification Description Language (SDL) defined in ITU-T Recommendation Z.100 [2]. The SDL process represents the behaviour of the network in providing SS-AP.

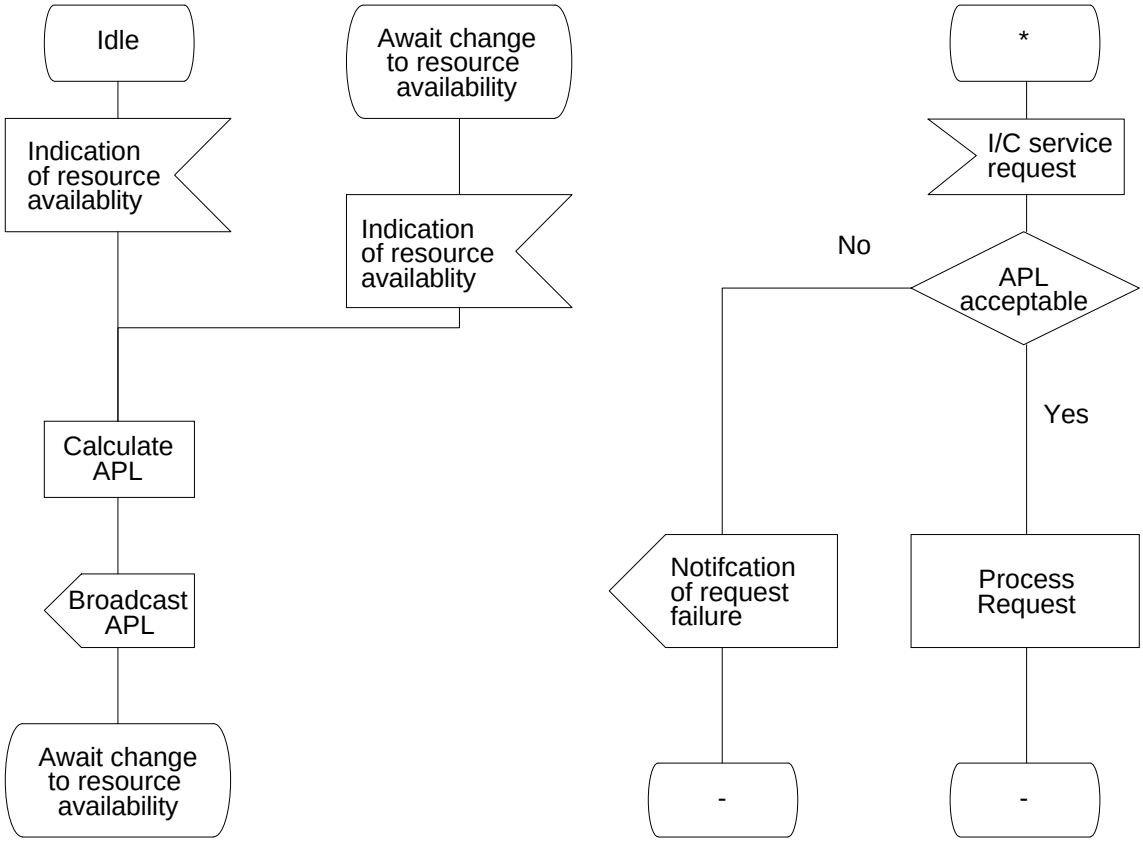

Figure 1: SS-AP supplementary service, overall SwMI SDL

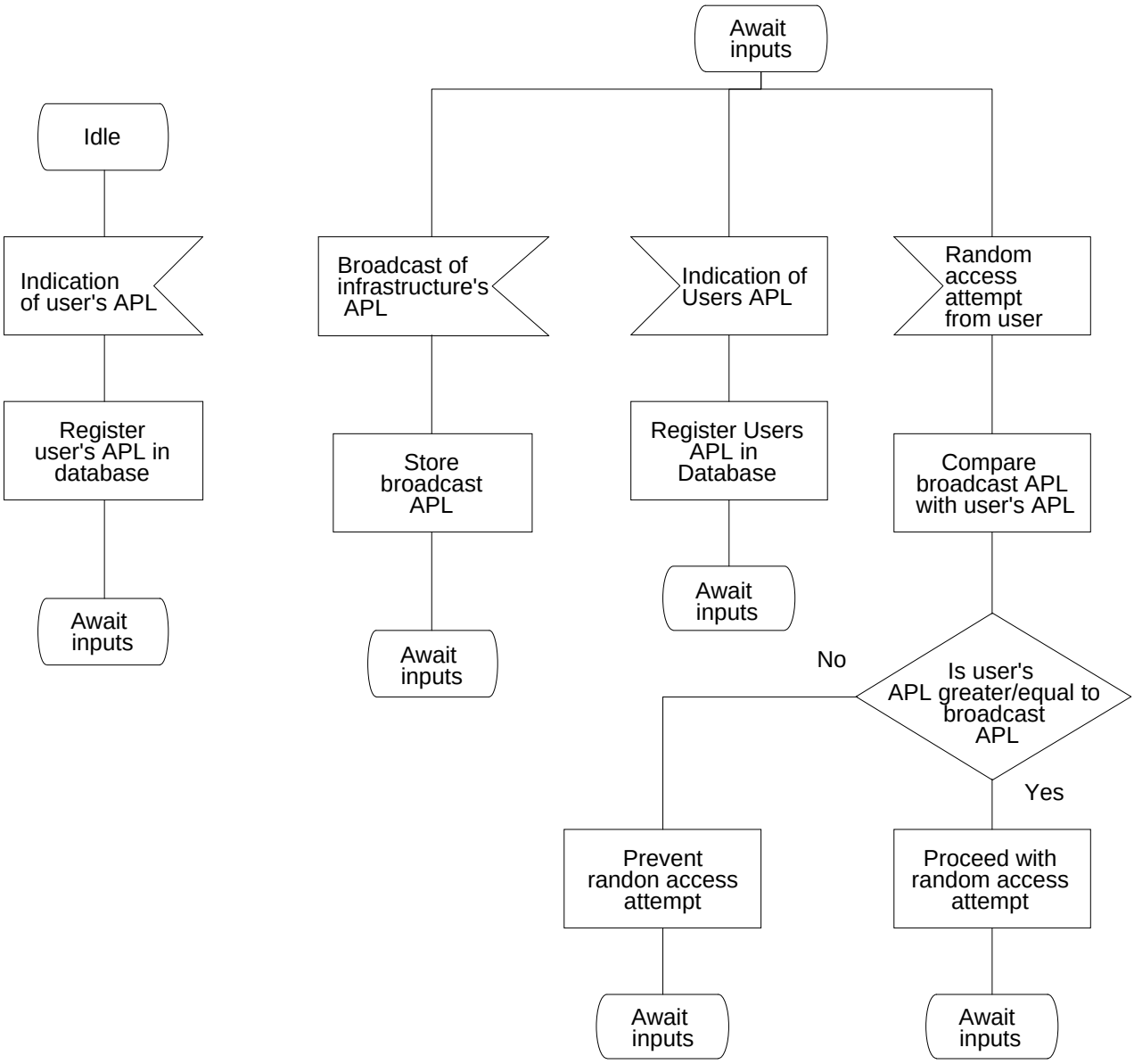

Figure 2: SS-AP supplementary service, overall SDL

History

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