



**Terrestrial Trunked Radio (TETRA);
Voice plus Data (V+D);
Part 3: Interworking at the Inter-System Interface (ISI);
Sub-part 14: Transport layer independent
Additional Network Feature
Short Data Service (ANF-ISISDS)**

Reference

DTS/TCCE-03244

Keywords

ANF, interworking, SDS, TETRA, V+D

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Contents

| | |
|---|----|
| Intellectual Property Rights | 6 |
| Foreword | 6 |
| Modal verbs terminology | 7 |
| 1 Scope | 8 |
| 2 References | 8 |
| 2.1 Normative references | 8 |
| 2.2 Informative references | 9 |
| 3 Definitions and abbreviations | 10 |
| 3.1 Definitions | 10 |
| 3.2 Abbreviations | 10 |
| 4 ANF-ISISDS stage 1 specification | 10 |
| 4.1 Description | 10 |
| 4.2 Overview of operation | 10 |
| 4.3 Security concerns | 10 |
| 4.4 Procedures | 11 |
| 4.4.1 Provision/withdrawal | 11 |
| 4.4.2 Normal procedures | 11 |
| 4.4.2.1 Activation/deactivation/registration/interrogation | 11 |
| 4.4.2.2 Invocation and operation | 11 |
| 4.4.3 Exceptional procedures | 12 |
| 4.4.3.1 Activation/deactivation/registration/interrogation | 12 |
| 4.4.3.2 Invocation and operation | 12 |
| 4.5 The generic ANF-ISISDS stage 1 service model | 12 |
| 4.5.1 Introduction | 12 |
| 4.5.2 Primitive definitions | 13 |
| 4.5.3 Parameter description | 14 |
| 5 ANF-ISISDS stage 2 specification | 16 |
| 5.1 Overview of functional entities | 16 |
| 5.1.1 Introduction | 16 |
| 5.1.2 Roles of the functional entities | 16 |
| 5.1.3 Relationships between Fes | 16 |
| 5.2 Information flow | 16 |
| 5.2.1 Definitions of information flows | 16 |
| 6 ANF-ISISDS stage 3 specification | 17 |
| 6.1 General on ANF-ISISDS | 17 |
| 6.2 TETRA ANF-ISISDS PDUs | 17 |
| 6.2.1 TETRA information encoding | 17 |
| 6.2.2 ISISDS-UNITDATA PDU | 18 |
| 6.2.3 Information element encoding | 18 |
| 6.2.3.1 Called party extension | 18 |
| 6.2.3.2 Called party external subscriber number | 18 |
| 6.2.3.3 Called party SSI | 18 |
| 6.2.3.4 Calling party extension | 18 |
| 6.2.3.5 Calling party external subscriber number | 19 |
| 6.2.3.6 Calling party external subscriber number parameters | 19 |
| 6.2.3.7 Calling party SSI | 19 |
| 6.2.3.8 Hop count | 19 |
| 6.2.3.9 ISISDS Subtype | 20 |
| 6.2.3.10 Length of user defined data-4 | 20 |
| 6.2.3.11 MSISDN present as external subscriber number | 20 |
| 6.2.3.12 Number of digits in called party external subscriber number | 20 |
| 6.2.3.13 Number of digits in calling party external subscriber number | 20 |

| | | |
|----------|---|----|
| 6.2.3.14 | PDU type..... | 20 |
| 6.2.3.15 | Pre-coded status..... | 20 |
| 6.2.3.16 | Security level at the calling user air interface..... | 21 |
| 6.2.3.17 | Selected area number..... | 21 |
| 6.2.3.18 | Short data type identifier..... | 21 |
| 6.2.3.19 | User defined data-1..... | 21 |
| 6.2.3.20 | User defined data-2..... | 21 |
| 6.2.3.21 | User defined data-3..... | 21 |
| 6.2.3.22 | User defined data-4..... | 21 |

Annex A (normative): Interaction with other TETRA supplementary services and ANFs 22

| | | |
|------|--|----|
| A.1 | Calling Line Identification Presentation (SS-CLIP)..... | 22 |
| A.2 | Connected Line Identification Presentation (SS-COLP)..... | 22 |
| A.3 | Calling/Connected Line Identification Restriction (SS-CLIR)..... | 22 |
| A.4 | Connected Name Identification Presentation (SS-CONP)..... | 22 |
| A.5 | Completion of Calls of Busy Subscriber (SS-CCBS)..... | 22 |
| A.6 | Completion of Calls on No Reply (SS-CCNR)..... | 22 |
| A.7 | Call Forward Unconditional (SS-CFU)..... | 22 |
| A.8 | Call Forwarding Busy (SS-CFB)..... | 22 |
| A.9 | Call Forwarding No Reply (SS-CFNR)..... | 23 |
| A.10 | Call Report (SS-CR)..... | 23 |
| A.11 | Talking Party Identification (SS-TPI)..... | 23 |
| A.12 | List Search Call (SS-LSC)..... | 23 |
| A.13 | Call Authorized by Dispatcher (SS-CAD)..... | 23 |
| A.14 | Short Number Addressing (SS-SNA)..... | 23 |
| A.15 | Area Selection (SS-AS)..... | 23 |
| A.16 | Access Priority (SS-AP)..... | 23 |
| A.17 | Priority Call (SS-PC)..... | 23 |
| A.18 | Call Waiting (SS-CW)..... | 23 |
| A.19 | Call Hold (SS-HOLD)..... | 24 |
| A.20 | Late Entry (SS-LE)..... | 24 |
| A.21 | Transfer of Control (SS-TC)..... | 24 |
| A.22 | Pre-emptive Priority Call (SS-PPC)..... | 24 |
| A.23 | Include Call (SS-IC)..... | 24 |
| A.24 | Barring of Outgoing Calls (SS-BOC)..... | 24 |
| A.25 | Barring of Incoming Calls (SS-BIC)..... | 24 |
| A.26 | Discreet Listening (SS-DL)..... | 24 |
| A.27 | Ambience Listening (SS-AL)..... | 24 |
| A.28 | Dynamic Group Number Assignment (SS-DGNA)..... | 24 |
| A.29 | Call Retention (SS-CRT)..... | 24 |
| A.30 | ISI Individual Call (ANF-ISIIC)..... | 25 |
| A.31 | ISI group call (ANF-ISIGC)..... | 25 |

| | |
|---|-----------|
| A.32 ISI Mobility Management (ANF-ISIMM)..... | 25 |
| Annex B (informative): Change Requests | 26 |
| History | 27 |

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee TETRA and Critical Communications Evolution (TCCE).

The present document is part 3, sub-part 14 of a multi-part deliverable covering the Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D), as identified below:

Part 1: "General network design";

Part 2: "Air Interface (AI)";

Part 3: "Interworking at the Inter-System Interface (ISI)":

Sub-part 1: "General design";

Sub-part 2: "Additional Network Feature Individual Call (ANF-ISIIC)";

Sub-part 3: "Additional Network Feature Group Call (ANF-ISIGC)";

Sub-part 4: "Additional Network Feature Short Data Service (ANF-ISISDS)";

Sub-part 5: "Additional Network Feature for Mobility Management (ANF-ISIMM)";

Sub-part 6: "Speech format implementation for circuit mode transmission";

Sub-part 7: "Speech Format Implementation for Packet Mode Transmission";

Sub-part 8: "Generic Speech Format Implementation";

Sub-part 9: "Transport layer independent, General design";

Sub-part 10: "General design, PSS1 over E.1";

Sub-part 11: "General design, SIP/IP";

Sub-part 12: "Transport layer independent Additional Network Feature Individual Call (ANF-ISIIC)";

Sub-part 13: "Transport layer independent Additional Network Feature Group Call (ANF-ISIGC)";

Sub-part 14: "Transport layer independent Additional Network Feature Short Data Service (ANF-ISISDS)";

Sub-part 15: Transport layer independent Additional Network Feature, Mobility Management (ANF-ISIMM);

Part 4: "Gateways basic operation";

Part 5: "Peripheral Equipment Interface (PEI)";

Part 7: "Security";

Part 9: "General requirements for supplementary services";

Part 10: "Supplementary services stage 1";

Part 11: "Supplementary services stage 2";

Part 12: "Supplementary services stage 3";

Part 13: "SDL model of the Air Interface (AI)";

Part 14: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 15: "TETRA frequency bands, duplex spacings and channel numbering";

Part 16: "Network Performance Metrics";

Part 17: "TETRA V+D and DMO specifications";

Part 18: "Air interface optimized applications";

NOTE 1: Part 3, sub-parts 6 and 7 (Speech format implementation), part 4, sub-part 3 (Data networks gateway), part 10, sub-part 15 (Transfer of control), part 13 (SDL) and part 14 (PICS) of this multi-part deliverable are in status "historical" and are not maintained.

NOTE 2: Some parts are also published as Technical Specifications such as ETSI TS 100 392-2 and those may be the latest version of the document.

The current document is based on ETSI EN 300 392-3-4 [i.1]. The main changes are:

- Removal of any reference to the bearer protocol.

For all subparts in the TETRA specification ETSI EN 300 392-3, "Interworking at the Inter-System Interface (ISI)" the terms ISI and TETRA ISI are equivalent.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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1 Scope

The TETRA V+D interworking - at the Inter-System Interface (ISI) part defines the interworking between TETRA networks over the corresponding interface: the Inter-System Interface (ISI). It comprises the following sub-parts:

- Transport layer independent General design [3];
- General Design, PSS1 over E.1 [i.2];
- General Design, SIP/IP [i.3];
- Transport layer independent Additional Network Feature - ISI Individual Call (ANF-ISIIC) [i.4];
- Transport layer independent Additional Network Feature - ISI Group Call (ANF-ISIGC) [2];
- Transport layer independent Additional Network Feature - ISI Short Data service (ANF-ISISDS) (the present document);
- Transport layer independent Additional Network Feature - ISI Mobility Management (ANF-ISIMM) [i.5];
- Generic Speech Format Implementation [i.6].

The present document specifies the Additional Network Function (ANF) - Inter-System Interface (ISI) Short Data service (ANF-ISISDS) which is part of the Interworking at the Inter-System Interface (ISI) of the Terrestrial Trunked Radio system (TETRA) supporting Voice and Data (V+D). This service comprises of:

- TETRA short message transmission over the ISI to individual and group addresses;
- TETRA pre-defined status message transmission over the ISI to individual and group addresses.

ANF-ISISDS enables short data and status messages to be transferred between a user registered in one TETRA network to another user registered in another TETRA network, operating at the ISI of both SwMIs.

Like all other Additional Network Feature (ANF) specifications, those of ANF-ISISDS are produced in three stages, according to the method described in Recommendation ITU-T I.130 [4]. The present document contains the stage 1 and 2 descriptions of ANF-ISIIC, and stage 3 description. The stage 1 description specifies the ANF as seen by its users, which are essentially the CMCE SDS entities in both TETRA networks. The stage 2 description identifies the functional entities involved in the ANF and the information flows between them. The stage 3 description of ANF-ISISDS specifies its protocol.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <https://docbox.etsi.org/Reference/>.

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The following referenced documents are necessary for the application of the present document.

- [1] ETSI EN 300 392-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".

- [2] ETSI TS 100 392-3-13: "TCCE; Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D) Part 3: Interworking at the Inter-System Interface (ISI) Sub-part 13: Transport layer independent Additional Network Feature Group Call (ANF-ISIGC)".
- [3] ETSI TS 100 392-3-9: "TCCE; Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 9: Transport layer independent, General design".
- [4] Recommendation ITU-T I.130: "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [5] ETSI EN 300 392-12-8: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary services stage 3; Sub-part 8: Area Selection (AS)".
- [6] ETSI EN 300 392-9: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 9: General requirements for supplementary services".
- [7] ISO/IEC 11571 (1998): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Networks - Addressing".
- [8] Recommendation ITU-T E.164: "The international public telecommunication numbering plan".
- [9] Recommendation ITU-T X.121: "International numbering plan for public data networks".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI EN 300 392-3-4: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 4: Additional Network Feature Short Data Service (ANF-ISISDS)".
- [i.2] ETSI TS 100 392-3-10: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 10: General design, PSS1 over E.1".
- [i.3] ETSI TS 100 392-3-11: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 11: General design, SIP/IP".
- [i.4] ETSI TS 100 392-3-12: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 12: Transport Layer Independent Additional Network Feature Individual Call (ANF-ISIIC)".
- [i.5] ETSI TS 100 392-3-15: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 15: Transport layer independent Additional Network Feature, Mobility Management (ANF-ISIMM)".
- [i.6] ETSI TS 100 392-3-8: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 8: Generic Speech Format Implementation".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI EN 300 392-2 [1] and ETSI TS 100 392-3-9 [3] apply.

NOTE: In the present document the term visited SwMI follows the definition of the Air Interface standard ETSI EN 300 392-2 [1]: TETRA network which MNI is not equal to the user's MNI.

3.2 Abbreviations

For the purposes of the present document, the abbreviations defined in ETSI EN 300 392-2 [1], ETSI TS 100 392-3-9 [3] and ETSI TS 100 392-3-13 [2] apply.

4 ANF-ISISDS stage 1 specification

4.1 Description

ANF-ISISDS provides support of the SDS service described in ETSI EN 300 392-2 [1], clause 13, across the ISI connection between 2 SwMIs. In addition the present document supports the embedded SDS-TL service described in ETSI EN 300 392-2 [1].

NOTE: The interpretation of all status code values contained in predefined status or short message services are not defined in the TETRA suite of standards. The consistent interpretation of these code values in user equipment will not be made by the ANF-ISISDS service but will be left to end-users to co-ordinate codeset interpretation.

4.2 Overview of operation

ANF-ISISDS shall transparently take the SDS message as presented by the originating SwMI and transport it to the peer ANF-ISISDS entity in the destination SwMI.

There shall be a single invocation of ANF-ISISDS per SDS transfer. Each message therefore is considered as independent. Group addressed SDS shall be sent to the group (linking) controlling SwMI only for further distribution by that SwMI to each participating SwMI.

ANF-ISISDS assumes that an equivalent to the TNSDS-SAP defined in ETSI EN 300 392-2 [1], clause 13 exists in the SwMI that provides an equivalent set of primitives.

For outgoing SDS messages the SwMI shall have received an equivalent to the TNSDS-UNITDATA indication primitive with those extensions required to indicate area selection. It shall then determine the destination SwMI. ANF-ISISDS shall only be invoked if the destination is on another SwMI.

For incoming SDS ANF-ISISDS shall deliver the SDS message to the SwMI in like manner to any internal SwMI device.

4.3 Security concerns

The originating SwMIs shall indicate the security class in use at the air interface for the calling party. The destination SwMI may use the same or higher security class when delivering the message to called party/parties or it may discard any message for which the originating SwMI is operating at a numerically higher security class.

4.4 Procedures

4.4.1 Provision/withdrawal

ANF-ISISDS shall always be available.

4.4.2 Normal procedures

4.4.2.1 Activation/deactivation/registration/interrogation

ANF-ISISDS shall always be activated. Registration and interrogation are not applicable to this ANF.

4.4.2.2 Invocation and operation

ANF-ISISDS shall be invoked when a short data service request has been received from the Short Data functional entity (TNSDS-SAP) within a SwMI or an ANF-ISISD PDU has been received over ISI. The invoked ANF-ISISDS Entity shall pass the ANF-ISISD PDU received over ISI to the Short Data functional entity (TNSDS-SAP) for further processing.

In all cases the Short Data functional entity may, depending on the local policies for handling of STATUS and SDS messages, deny the service and prevent the message sending further over ISI.

When sending over ISI is allowed by the Short Data functional entity the destination address may reveal one of the following scenarios:

- 1) The destination MS TETRA user identity belongs to the originating SwMI. In this scenario the destination user has migrated to a visited SwMI the details of which are known in the originating SwMI database.
- 2) The destination MS TETRA user identity does not belong to the originating SwMI and the destination MS is not migrated to the originating SwMI. In this scenario the details of the destination home SwMI are known from the destination TETRA user identity.
- 3) The destination MS TETRA user identity does not belong to the originating SwMI but the destination MS is migrated to the originating SwMI and the originating SwMI has knowledge of the concerned user SDS profiles.
- 4) The destination address belongs to another SwMI. In this scenario the details of the destination SwMI are known from the destination TETRA identity.
- 5) The destination is a local group and group members are located in another SwMI. In this scenario the details of the destination SwMIs are known in the originating SwMI database.
- 6) The destination is a ISI linked group. In this scenario the details of the destination SwMIs are known in the originating SwMI database.

The present document shall address scenarios 1), 2), 4), 5) and 6) only. Scenario 3) shall not invoke ANF-ISISDS.

The routing of the message is determined as follows:

- a) If the destination address is a foreign TSI and the destination is not an MS located in the originating SwMI; the originating SwMI shall send the ISISD UNITDATA PDU to the home SwMI of the destination address based on the called party MNI.
- b) If the destination is an individual MS and the home SwMI detects that the MS has migrated into a foreign SwMI; the home SwMI of the destination MS shall send the ISISD UNITDATA PDU to the visited SwMI. The message may be originated from the home SwMI of the called MS or received over ISI from another SwMI. The home SwMI may also change the destination address if CFU service is active for the MS.
- c) If the destination is a local group address and the SwMI detects that there are group members located in other SwMIs (based on the group attachment information of the MSs); the home SwMI of the group shall send the ISISD UNITDATA PDU to the SwMIs where the group members are located. The message may be originated from the home SwMI of the group or received over ISI from another SwMI.

- d) If the destination is a local group address and the SwMI detects that the group is linked to a group in a foreign SwMI, the SwMI shall send the ISISD UNITDATA PDU further depending on the SwMI role in the group linking as follows:
- if it is not the controlling SwMI for that group linking, shall send the ISISD UNITDATA PDU to the controlling SwMI;
 - if it is the controlling SwMI for that group linking, shall send the ISISD UNITDATA PDU to the participating SwMIs.

4.4.3 Exceptional procedures

4.4.3.1 Activation/deactivation/registration/interrogation

Not applicable.

4.4.3.2 Invocation and operation

Short Data functional entity (TNSDS-SAP) or ANF-ISISDS of the originating SwMI can reject a service request for any of the following reasons:

- user not subscribed to inter system short data service;
- the local policy for handling of STATUS and SDS messages prevent the message sending further over ISI;
- inter system interface out of order; or
- no ISI connection to the destination SwMI;
- it is known that the remote SwMI does not support short data service.

Short Data functional entity (TNSDS-SAP) or ANF-ISISDS of the destination SwMI can reject a service request for any of the following reasons:

- unknown address;
- user not subscribed to inter system short data service;
- the local policy for handling of STATUS and SDS messages prevent the message sending further.

The destination SwMI may reject the ANF-ISISD service request with an appropriate failure indication sent in ISI REJECT (ISISD service not supported) or ISI ERROR APDU (erroneous ISI APDU) as defined in ETSI TS 100 392-3-9 [3].

4.5 The generic ANF-ISISDS stage 1 service model

4.5.1 Introduction

ANF-ISISDS shall be a SwMI V+D layer 3 (network layer) service provider. ANF-ISISDS shall offer services to SDS entity of SwMI CMCE.

The generic stage 1 service model is illustrated in Figure 1. The control aspects of the services are defined in terms of primitives. The primitives are sent across the ISISDS Service Access Points (ISISDS-SAPs) between the service provider and the service users. The ANF-ISISD services use the following two generic service primitives:

- request (req); and
- indication (ind).

The service-specific primitives are defined as part of the stage 1 service description in the following clauses. In the stage 1 descriptions, the ANF-ISISDS shall be seen as one entity.

NOTE: The stage 2 and 3 descriptions follow the stage 1 descriptions. In the stage 2 descriptions the ANF-ISISDS service behaviour is broken to Functional Entities (Fes). The stage 3 descriptions define the protocol aspects of the ANF-ISISDS services.

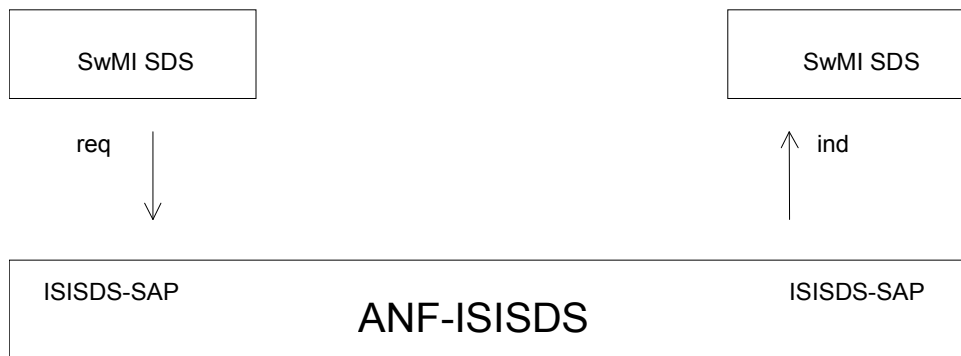


Figure 1: ANF-ISISD stage 1 service model

4.5.2 Primitive definitions

The SDS entity of SwMI CMCE shall invoke ANF-ISISDS by issuing an ANFISISDS-UNITDATA_req or ANFISISDS-STATUS_req primitives described in tables 1 and 2.

NOTE: The service is unconfirmed on the ISI service level.

In tables 1 and 2 listing the service elements in primitives, the column headed "Request" indicates which of these service elements are Mandatory (M) and which are Optional (O) in a request information flow, and the column headed "Indication" indicates which of these service elements are Mandatory (M) and which are Optional (O) in an Indication information flow.

Table 1: Parameters for the ANFISISDS-STATUS primitive

| Parameter | Request | Indication |
|--|---------|------------|
| Selected area number | O | O |
| Called party SSI | M | M |
| Called party extension | M | M |
| Called party external subscriber number | O | O |
| Calling party SSI | M | M |
| Calling party extension | M | M |
| Calling party external subscriber number | O | O |
| Status number | M | M |
| Hop count | M | M |
| Security level at the calling user air interface | M | M |

Table 2: Parameters for the ANFISISDS-UNITDATA primitive

| Parameter | Request | Indication |
|---|--------------|--------------|
| Selected area number | O | O |
| Called party SSI | M | M |
| Called party extension | M | M |
| Called party external subscriber number | O | O |
| Calling party SSI | M | M |
| Calling party extension | M | M |
| Calling party external subscriber number | O | O |
| MSISDN present as external subscriber number | O | O |
| Calling external subscriber number parameters | O | O |
| Short data type identifier | M | M |
| User defined data-1 | C (see note) | C (see note) |
| User defined data-2 | C (see note) | C (see note) |
| User defined data-3 | C (see note) | C (see note) |
| User defined data-4 | C (see note) | C (see note) |
| Hop count | M | M |
| Security level at the calling user air interface | M | M |
| NOTE: Depending on the value of short data type identifier. | | |

4.5.3 Parameter description

Parameters shall be part of the primitives at the TNSDS SAP. When applied the parameters shall contain the values specified in this clause.

Called party extension =

MCC + MNC.

Called party SSI =

ISSI; or

GSSI.

Calling external subscriber number parameters =

Numbering plan identification;

Type of number; and

Screening indicator.

Calling party extension =

MCC + MNC.

Calling party SSI =

ISSI; or

GSSI.

External Subscriber Number =

Up to 24 digits.

Hop count =

Record of hops in path.

MSISDN present as external subscriber number =

Not an MSISDN; or

MSISDN.

Security level at the calling user air interface =

No air interface encryption required;

Air interface encryption required 1;

Air interface encryption required 2.

Selected area number =

See SS-AS, ETSI EN 300 392-12-8 [5].

Status number =

V emergency;

1 to 31 743 reserved;

31 744 to 32 767 used for SDS-TL;

32 768 to 65 535 available for TETRA network specific definition.

Short data type identifier =

0 user defined data-1;

1 user defined data-2;

2 user defined data-3;

3 user defined data-4.

User defined data 1 =

16 bit user defined data.

User defined data 2 =

32 bit user defined data.

User defined data 3 =

64 bit user defined data.

User defined data-4 =

user defined data bits, maximum length 2 047 bits.

5 ANF-ISISDS stage 2 specification

5.1 Overview of functional entities

5.1.1 Introduction

The following functional entities shall exist:

- FE1 Originating Short Data (TNSDS-SAP) functional entity;
- FE2 Originating ISI Short Data (ANF-ISISD) transfer functional entity;
- FE3 Destination ISI Short Data (ANF-ISISD) transfer functional entity;
- FE4 Destination Short Data (TNSDS-SAP) functional entity.

5.1.2 Roles of the functional entities

The role of FE1 is to invoke FE2 when delivery of an SDS or Status message over ISI is needed, that is, the called party is/parties are located in another SwMI.

The role of FE2 is to accept from FE1 a request to deliver an SDS or Status message to the peer FE3 entity.

FE2 shall increment the value of hop count on every transmission. This may be used to detect problems (maximum value of hop count should be 2 (e.g. from originating to home of destination MS, from home of destination MS to SwMI where destination is registered)).

The role of FE3 is to forward a received SDS or Status message to the FE4 entity.

5.1.3 Relationships between Fes

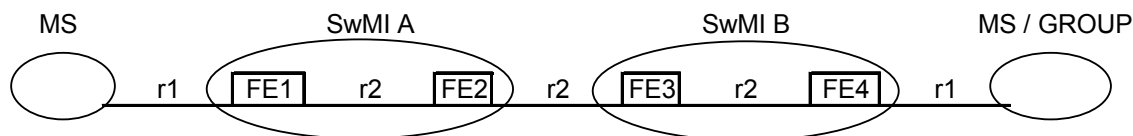


Figure 2: Fes and the relationships between them

5.2 Information flow

5.2.1 Definitions of information flows

Each ANF-ISISDS UNIT-DATA PDU message is sent with a call independent signalling connection from the originating SwMI to the destination SwMI.

In case the destination address is an individual address the ANF-ISISD message can be sent from an originating SwMI towards the home SwMI of the called party and/or from the home SwMI (now acting as a originating SwMI) towards the current visited SwMI. In case the home SwMI receives the message over ISI and sends it further to visited SwMI, these operations are independent of each other in ANF-ISISD layer.

In case the destination address is a group address the ANF-ISISD message can be sent from an originating SwMI to the home SwMI of the group and/or from the home SwMI of the group (now acting as a originating SwMI) to the location SwMIs of the group members. In case of group linking the ANF-ISISD message can be sent from an originating SwMI to the home SwMI of the group and/or from the home SwMI of the group (now acting as a originating SwMI), to the group controlling SwMI, and from the group controlling SwMI (now acting as a originating SwMI) to the participating SwMIs.

In ANF-ISISD layer all these operations are independent of each other.

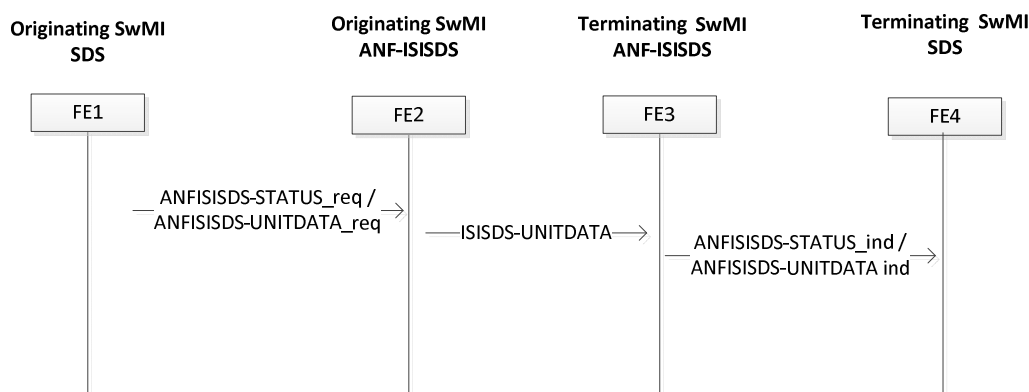


Figure 3: SDS/Status from SwMIA to SwMIB

The ANF-ISISDS-UNITDATA request is an unconfirmed information flow.

Upon receipt of an ANFISISDS-STATUS or ANFISISDS-UNITDATA request primitive from FE1 the FE2 sends ISISDS-UNITDATA over ISI to FE3. When ISISD-UNITDATA is received over the ISI the ANF-ISISDS service (FE3) shall be invoked in the destination SwMI FE3 converts the parameters received in ISISDS-UNITDATA into the ANFISISDS-STATUS or in the ANFISISDS-UNITDATA indication primitive that is sent to FE4.

6 ANF-ISISDS stage 3 specification

6.1 General on ANF-ISISDS

As defined in clause 5.2.1 the originating SwMI sends ISISD UNITDATA PDU carrying the STATUS and SDS messages over ISI to the destination SwMI if the sending of the message is permitted and possible as defined in clauses 4.4.2.2 and 4.4.3.2. The destination SwMI may send the message further over ISI, in that case that destination SwMI becomes originating SwMI for the new message delivery.

In all cases ISISD UNITDATA PDU transfer over ISI is considered as independent ANF-ISISDS service, thus the INVOKE IDs of the ISI INVOKE APDUs are independent. Also if there will be an application layer response (e.g. SDS-TL REPORT) to the sent SDS / status message, the response is handled as independent ANF-ISISD service request.

NOTE: The protocol requires that all the involved SwMIs, originating, home controlling, participating and final destination SwMIs support ANF-ISISDS. In other words the re-routing of the STATUS and SDS messages is not applied.

6.2 TETRA ANF-ISISDS PDUs

6.2.1 TETRA information encoding

The information contained in the following PDU description shall be encoded using the same rules as defined in annex E of ETSI EN 300 392-2 [1] (for TETRA air interface PDUs).

6.2.2 ISISDS-UNITDATA PDU

The contents of the ISISDS-UNITDATA PDU shall be as defined in table 3.

Table 3: Contents of the ISISDS-UNITDATA PDU

| Parameter | Type | M/O/C | Length | Notes |
|---|------|-------|--------|------------|
| PDU type | 1 | M | 3 | |
| Security level at the calling user air interface | 1 | M | 2 | |
| Called party SSI | 1 | M | 24 | |
| Called party extension | 1 | M | 24 | |
| Number of digits in called external subscriber number | 1 | M | 5 | |
| Called party external subscriber number | | C | varies | see note 1 |
| Calling party SSI | 1 | M | 24 | |
| Calling party extension | 1 | M | 24 | |
| Number of digits in calling external subscriber number | 1 | M | 5 | |
| Calling party external subscriber number | | C | varies | see note 2 |
| MSISDN present as external subscriber number | | C | 1 | see note 7 |
| Calling external subscriber number parameters | | C | 9 | see note 7 |
| ISISDS subtype | 1 | M | 1 | |
| Pre-coded status | | C | 16 | see note 3 |
| Short data type identifier | | C | 2 | see note 4 |
| User defined data-1 | | C | 16 | see note 5 |
| User defined data-2 | | C | 32 | see note 5 |
| User defined data-3 | | C | 64 | see note 5 |
| Length of user defined data-4 | | C | 11 | see note 5 |
| User defined data-4 | | C | varies | see note 6 |
| Hop count | 1 | M | 2 | |
| Selected area number | 2 | O | 8 | |
| NOTE 1: The number of digits in this information element shall be as defined in the Number of digits in called external subscriber number. | | | | |
| NOTE 2: The number of digits in this information element shall be as defined in the Number of digits in calling external subscriber number. | | | | |
| NOTE 3: This information element shall be present when the ISISDS subtype is "Pre-defined status". | | | | |
| NOTE 4: This information element shall be present when the ISISDS subtype is "Short data type identifier". | | | | |
| NOTE 5: One of these shall be present depending on the value of short data type identifier. | | | | |
| NOTE 6: The length of this information element in bits shall be conditional on the Length of the User defined data-4 information element. | | | | |
| NOTE 7: Conditional on the value of the information element number of digits in calling external subscriber number being different from 0. | | | | |

6.2.3 Information element encoding

6.2.3.1 Called party extension

The called party extension information element shall be encoded as defined in clause 14.8.7 of ETSI EN 300 392-2 [1].

6.2.3.2 Called party external subscriber number

The called party external subscriber number can consist of n digits where n shall be less than or equal to 24. The digits of the external subscriber number shall be in descending order (as normally dialled in man machine interface) in the information element. Each digit in the external subscriber number information element shall be encoded as defined in table 108 in clause 14.8.20 of ETSI EN 300 392-2 [1].

6.2.3.3 Called party SSI

The called party SSI information element shall be encoded as defined in clause 14.8.8 of ETSI EN 300 392-2 [1].

6.2.3.4 Calling party extension

The information element shall be encoded as defined in clause 14.8.10 of ETSI EN 300 392-2 [1].

6.2.3.5 Calling party external subscriber number

The calling party external subscriber number can consist of n digits where n shall be less than or equal to 24. The digits of the external subscriber number shall be in descending order (as normally dialled in man machine interface) in the information element. Each digit in the external subscriber number information element shall be encoded as defined in table 108 in clause 14.8.20 of ETSI EN 300 392-2 [1].

6.2.3.6 Calling party external subscriber number parameters

The calling party external subscriber number parameters information element shall be as shown in table 4, refer also to ETSI EN 300 392-9 [6].

Table 4: Calling party external subscriber number parameters information element contents

| Information element | Length | Value | Remarks |
|--|--------|-------------------|---|
| Numbering plan identification | 4 | 0000 ₂ | Unknown |
| | | 0001 ₂ | PSTN/ISDN/GSM (see note 1) |
| | | 0010 ₂ | Reserved |
| | | 0011 ₂ | Data Numbering Plan (see note 2) |
| | | 0100 ₂ | Reserved (Telex) |
| | | 0101 ₂ | Reserved |
| | | etc. | etc. |
| | | 0111 ₂ | Reserved |
| | | 1000 ₂ | National standard numbering plan |
| | | 1001 ₂ | Private numbering plan |
| | | 1010 ₂ | Reserved for extension |
| | | etc. | etc. |
| | | 1111 ₂ | Reserved for extension |
| Type of number | 3 | 000 ₂ | Unknown/unknown (see note 3) |
| | | 001 ₂ | International number/level 2 regional number (see note 3) |
| | | 010 ₂ | National number/level 1 regional number (see note 3) |
| | | 011 ₂ | Network specific number/PISN specific number (see note 3) |
| | | 100 ₂ | Subscriber number/level 0 regional number (see note 3) |
| | | 101 ₂ | Reserved for extension |
| | | etc. | etc. |
| | | 111 ₂ | Reserved for extension |
| Screening indicator | 2 | 00 ₂ | User provided, not screened |
| | | 01 ₂ | User provided, verified and passed |
| | | 10 ₂ | User provided, verified and failed |
| | | 11 ₂ | Network provided |
| NOTE 1: See Recommendation ITU-T E.164 [8]. | | | |
| NOTE 2: See Recommendation ITU-T X.121 [9]. | | | |
| NOTE 3: The second parameter is the meaning of the information element type of number as defined in ISO/IEC 11571 [7] when the numbering plan identification is the private numbering plan (i.e. binary value of the information element equal to 1001). | | | |

6.2.3.7 Calling party SSI

The calling party SSI information element shall be encoded as defined in clause 14.8.11 of ETSI EN 300 392-2 [1].

6.2.3.8 Hop count

The hop count information element shall indicate how many times the message is sent over an ISI connection. The value may be 1, 2 or 3. Value 0 is not used in the present document.

6.2.3.9 ISISDS Subtype

The ISISDS subtype information element shall identify the type of the data encoding as defined in table 5.

Table 5: ISISDS subtype information element contents

| Information element | Length | Value | Remark |
|---------------------|--------|----------------|---|
| ISISDS subtype | 1 | 0 ₂ | Pre-defined status |
| | | 1 ₂ | Short data type identifier (User defined data-1 to 4) |

6.2.3.10 Length of user defined data-4

The length of user defined data-4 information element shall indicate the length of the user defined data-4 in bit. The maximum length shall be 2 047 including the protocol identifier information element, refer to clause 14.8.52 of ETSI EN 300 392-2 [1].

6.2.3.11 MSISDN present as external subscriber number

The MSISDN present as external subscriber number information element shall indicate whether or not the related information element external subscriber number corresponds to an MSISDN. It shall be coded as defined in table 6.

Table 6: MSISDN present as external subscriber number information element content

| Information element | Length | Value | Remark |
|--|--------|-------|---|
| MSISDN present as external subscriber number | 1 | 0 | The related information element external subscriber number does not correspond to an MSISDN |
| | | 1 | The related information element external subscriber number corresponds to an MSISDN |

6.2.3.12 Number of digits in called party external subscriber number

The number of digits in called party external subscriber number information element shall indicate the length of the calling party external subscriber number in digits.

6.2.3.13 Number of digits in calling party external subscriber number

The number of digits in calling party external subscriber number information element shall indicate the length of the calling party external subscriber number in digits.

6.2.3.14 PDU type

The PDU type information element shall identify the type of TETRA PDU for ANF-ISISDS sent over the ISI. This information element shall be coded as defined in table 7.

Table 7: PDU type information element contents

| Information element | Length | Value | Remark |
|---------------------|--------|------------------|-----------------|
| PDU type | 3 | 000 ₂ | ISISDS-UNITDATA |
| | | 001 ₂ | Reserved |
| | | etc | etc. |
| | | 111 ₂ | Reserved |

6.2.3.15 Pre-coded status

The pre-coded status information element shall be encoded as defined in clause 14.8.34 of ETSI EN 300 392-2 [1].

6.2.3.16 Security level at the calling user air interface

The Security level at calling user air interface information element shall be encoded as presented in table 8.

Table 8: Security level information element contents

| Information element | Length | Value | Remark |
|--|--------|-----------------|--------------------------------------|
| Security level at the calling user air interface | 2 | 00 ₂ | No air interface encryption required |
| | | 01 ₂ | Air interface encryption required 1 |
| | | 10 ₂ | Air interface encryption required 2 |
| | | 11 ₂ | Reserved |

6.2.3.17 Selected area number

The selected area number information element shall be encoded as defined in clause 5.2.2.15 of ETSI EN 300 392-12-8 [5].

6.2.3.18 Short data type identifier

The short data type identifier information element shall be encoded as defined in clause 145.8.38 of ETSI EN 300 392-2 [1].

6.2.3.19 User defined data-1

The user defined data-1 information element shall be encoded as defined in clause 14.8.49 of ETSI EN 300 392-2 [1].

6.2.3.20 User defined data-2

The user defined data-2 information element shall be encoded as defined in clause 14.8.50 of ETSI EN 300 392-2 [1].

6.2.3.21 User defined data-3

The user defined data-3 information element shall be encoded as defined in clause 14.8.51 of ETSI EN 300 392-2 [1].

6.2.3.22 User defined data-4

The user defined data-4 information element shall be encoded as defined in clause 14.8.52 of ETSI EN 300 392-2 [1].

Annex A (normative): Interaction with other TETRA supplementary services and ANFs

A.1 Calling Line Identification Presentation (SS-CLIP)

Not applicable. The calling party identity is an integral part of SDS.

A.2 Connected Line Identification Presentation (SS-COLP)

Not applicable.

A.3 Calling/Connected Line Identification Restriction (SS-CLIR)

Not applicable. Not applicable to SDS as the calling party identity is an integral part of SDS.

A.4 Connected Name Identification Presentation (SS-CONP)

Not applicable.

A.5 Completion of Calls of Busy Subscriber (SS-CCBS)

Not applicable.

A.6 Completion of Calls on No Reply (SS-CCNR)

Not applicable.

A.7 Call Forward Unconditional (SS-CFU)

Shall be activated upon definition. Shall apply to all ANF-ISISDS messages directing the message to the forwarded to address. The definition of CFU may invoke ANF-ISISDS.

A.8 Call Forwarding Busy (SS-CFB)

Not applicable.

A.9 Call Forwarding No Reply (SS-CFNR)

Not applicable.

A.10 Call Report (SS-CR)

Not applicable.

A.11 Talking Party Identification (SS-TPI)

Not applicable.

A.12 List Search Call (SS-LSC)

Not applicable.

A.13 Call Authorized by Dispatcher (SS-CAD)

Not applicable.

A.14 Short Number Addressing (SS-SNA)

Not applicable.

A.15 Area Selection (SS-AS)

Contained within source Primitive. May be used to qualify the invocation of ANF-ISISDS. Carried in the transferred PDU for interpretation by receiving SwMI.

A.16 Access Priority (SS-AP)

Not applicable.

A.17 Priority Call (SS-PC)

Not applicable.

A.18 Call Waiting (SS-CW)

Not applicable.

A.19 Call Hold (SS-HOLD)

Not applicable.

A.20 Late Entry (SS-LE)

Not applicable.

A.21 Transfer of Control (SS-TC)

Not applicable.

A.22 Pre-emptive Priority Call (SS-PPC)

Not applicable.

A.23 Include Call (SS-IC)

Not applicable.

A.24 Barring of Outgoing Calls (SS-BOC)

Not applicable.

A.25 Barring of Incoming Calls (SS-BIC)

Not applicable.

A.26 Discreet Listening (SS-DL)

Not applicable.

A.27 Ambience Listening (SS-AL)

Not applicable.

A.28 Dynamic Group Number Assignment (SS-DGNA)

Not applicable.

A.29 Call Retention (SS-CRT)

Not applicable.

A.30 ISI Individual Call (ANF-ISIIC)

No interaction.

A.31 ISI group call (ANF-ISIGC)

No interaction.

A.32 ISI Mobility Management (ANF-ISIMM)

The mobility management shall allow ANF-ISISDS service to be used for MSs located in another network than their home network (based on migration service) and for group members not located in the home network of the target group (based on group attachment service) and for the message delivery further to linked groups (group linking service).

Annex B (informative): Change Requests

The present document contains Change Requests as described in table B.1.

Table B.1: Change Requests

| No | CR vers. | Standard Version | Clauses affected | Title | CR Status |
|----|-------------|---------------------|------------------|-------|-----------|
| | | | | | |
| | | | | | |
| | | | | | |

History

| Document history | | |
|-------------------------|----------|-------------|
| V1.1.1 | May 2018 | Publication |
| | | |
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| | | |