



**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)**

ETSI STANDARDS PREVIEW
https://standards.iteh.ai/en/standards/ETSI-100-392-3-12-V1.1.1-2018-05
4adb-99ab-540a13fc640b/

Reference

DTS/TCCE-03243

Keywords

ANF, interworking, TETRA, V+D

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2018.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members.

3GPP™ and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M logo is protected for the benefit of its Members.

GSM® and the GSM logo are trademarks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	8
Foreword	8
Modal verbs terminology	9
1 Scope	10
2 References	10
2.1 Normative references	10
2.2 Informative references	11
3 Definitions and abbreviations	12
3.1 Definitions	12
3.2 Abbreviations	13
4 ANF-ISIIC stage 1 specification	14
4.1 Description	14
4.1.1 General description	14
4.1.2 Qualifications on applicability to telecommunication services	14
4.2 Procedures	14
4.2.1 Provision/withdrawal	14
4.2.2 Normal procedures	15
4.2.2.1 Activation/deactivation/registration/interrogation	15
4.2.2.2 Invocation and operation	15
4.2.2.2.1 General	15
4.2.2.2.2 Call routing	15
4.2.2.2.3 Control of call time-out timers	15
4.2.2.2.4 Transmission control	16
4.2.2.2.5 Setup modification	16
4.2.2.2.6 Call modification	16
4.2.2.2.7 Call restoration after migration	16
4.2.2.2.8 Call clearing	17
4.2.2.2.9 Interaction between ANF-ISIICs	17
4.2.2.2.10 Resource queuing and allocation policies	17
4.2.3 Exceptional procedures	17
4.2.3.1 Activation/deactivation/registration/interrogation	17
4.2.3.2 Invocation and operation	17
4.3 Interactions with other TETRA supplementary services and ANFs	18
4.3.1 Introduction	18
4.3.2 Calling Line Identification Presentation (SS-CLIP)	18
4.3.3 Connected Line identification Presentation (SS-COLP)	18
4.3.4 Calling/connected Line Identification Restriction (SS-CLIR)	18
4.3.5 Call Report (SS-CR)	18
4.3.6 Talking Party Identification (SS-TPI)	18
4.3.7 Call Forwarding Unconditional (SS-CFU)	19
4.3.8 Call Forwarding on Busy (SS-CFB)	20
4.3.9 Call Forwarding on No Reply (SS-CFNRy)	22
4.3.10 Call Forwarding on Not Reachable (SS-CFNRC)	22
4.3.11 List Search Call (SS-LSC)	22
4.3.12 Call Authorized by Dispatcher (SS-CAD)	22
4.3.13 Short Number Addressing (SS-SNA)	23
4.3.14 Area Selection (SS-AS)	24
4.3.15 Access Priority (SS-AP)	24
4.3.16 Priority Call (SS-PC)	24
4.3.17 Call Waiting (SS-CW)	24
4.3.18 Call Hold (SS-HOLD)	24
4.3.19 Call Completion to Busy Subscriber (SS-CCBS)	24
4.3.20 Late Entry (SS-LE)	24
4.3.21 Pre-emptive Priority Call (SS-PPC)	25

4.3.22	Include Call (SS-IC)	25
4.3.23	Barring of Outgoing Calls (SS-BOC)	25
4.3.24	Barring of Incoming Calls (SS-BIC).....	25
4.3.25	Discreet Listening (SS-DL)	26
4.3.26	Ambience Listening (SS-AL)	26
4.3.27	Dynamic Group Number Assignment (SS-DGNA).....	26
4.3.28	Call Completion on No Reply (SS-CCNR).....	26
4.3.29	Call Retention (SS-CRT)	26
4.3.30	Additional Network Feature - Inter System Interface Group Call (ANF-ISIGC).....	27
4.3.31	Additional Network Feature - Inter System Interface Short Data Service (ANF-ISISDS).....	27
4.3.32	Additional Network Feature - Inter System Interface Mobility Management (ANF-ISIMM).....	27
4.3.33	Additional Network Feature - Inter System Interface Supplementary service (ANF-ISISS).....	27
4.4	Interworking considerations	27
5	ANF-ISIIC stage 2 specification	28
5.1	Functional model	28
5.1.1	Functional model description	28
5.1.2	Description of functional entities	32
5.1.2.1	Originating/Controlling SwMI individual call control application functional entity, FE1	32
5.1.2.2	Originating/Controlling SwMI ISI individual call originating functional entity, FE2	32
5.1.2.3	Called/Forward Switching SwMI call control functional entity, FE3	33
5.1.2.4	Called/Forward Switching SwMI ISI individual call functional entity, FE4	34
5.1.2.5	Terminating SwMI individual call control functional entity, FE5	34
5.1.2.6	ISI individual call terminating functional entity, FE6	34
5.1.2.7	New terminating SwMI call restoring functional entity, FE7	35
5.1.2.8	New terminating SwMI ISI call restoring functional entity (ANF-ISIIC), FE8	35
5.2	Information flow	35
5.2.1	Examples of information flow sequences	35
5.2.1.1	Introduction	35
5.2.1.2	Successful call set-up when the called user is registered in SwMI B and uses on/off hook signalling	36
5.2.1.3	Successful call set up when the called user is registered in SwMI B and uses direct set-up signalling	37
5.2.1.4	ANF-ISIIC set-up to a called user having migrated from SwMI B, using forward switching	38
5.2.1.5	ANF-ISIIC set-up to a called user having migrated from SwMI B, using re-routeing.....	38
5.2.1.6	Loop avoidance in case of intra-TETRA call	39
5.2.1.7	Unsuccessful ANF-ISIIC call set-up	40
5.2.1.8	Transmission control	41
5.2.1.9	Call modify	44
5.2.1.10	Call restoration after migration	44
5.2.1.11	Call clearing	47
5.2.1.12	Resource queuing and allocation	48
5.2.2	Definition of information flows	49
5.2.2.1	General	49
5.2.2.2	CALL RESTORE	49
5.2.2.3	CALL RESTORE PREPARE	50
5.2.2.4	CHARACTERISTIC CHANGE	50
5.2.2.5	COMPLETE	51
5.2.2.6	MIGRATION	51
5.2.2.7	MODIFY	52
5.2.2.8	RELEASE	52
5.2.2.9	SETUP	52
5.2.2.10	SETUP PROLONGATION	54
5.2.2.11	TROMBONE	54
5.2.2.12	TX-CEASED	54
5.2.2.12.1	TX-CEASED 1	54
5.2.2.12.2	TX-CEASED 2	54
5.2.2.13	TX-CONTINUE 1	55
5.2.2.14	TX-CONTINUE 2	55
5.2.2.15	TX-DEMAND	55
5.2.2.16	TX-GRANTED	56
5.2.2.17	TX-INTERRUPT	56

5.2.2.18	TX-WAIT	56
5.3	Functional entity actions	56
5.4	Allocation of functional entities to physical equipment/SwMIs	57
6	ANF-ISIIC stage 3 specification	59
6.1	ANF-ISIIC coding requirements	59
6.1.1	General	59
6.1.2	TETRA PDUs	59
6.1.2.1	General encoding rule	59
6.1.2.2	ISI-SETUP PDU message sent by the originating or the forward switching SwMI	60
6.1.2.3	ISI-PROGRESS PDU used to give information about the call progress	62
6.1.2.4	ISI-REDIRECT PDU sent by the called SwMI when it is not the terminating SwMI because of migration or SS-CF invocation	62
6.1.2.5	ISI-FORWARD SWITCH PDU sent by the originating or the forward switching SwMI to request forward switching	64
6.1.2.6	ISI-ALERTING PDU sent by by the terminating or the forward switching SwMI to give information about the connected party alerted	64
6.1.2.7	ISI-CONNECT PDU sent by by the terminating or the forward switching SwMI to give information that the connected party has answered the call	64
6.1.2.8	ISI-CALL PROCEEDING sent by the terminating SwMI before the ISI-ALERTING or ISI-CONNECT message	65
6.1.2.9	ISI-SETUP PROLONGATION PDU sent to prolong the call setup time	66
6.1.2.10	ISI CONNECT ACKNOWLEDGE PDU sent by the originating SwMI	66
6.1.2.11	Transmission control PDUs sent by the controlling SwMI	66
6.1.2.12	ISI-TX WAIT PDU possibly sent by either the controlling or the terminating SwMI	68
6.1.2.13	ISI-INFO DEMAND and ISI-INFO REPLY PDU possibly sent by either the originating or the terminating SwMI	68
6.1.2.14	Transmission control PDUs sent by the terminating SwMI	69
6.1.2.15	TETRA PDUs to restore the call after the calling or the connected user has migrated in a new SwMI	70
6.1.2.15.1	Case where no connection between the old SwMI and the new SwMI already exists or has not been identified	70
6.1.2.15.2	Cases where no new connection is needed between the old SwMI and the new SwMI	71
6.1.2.16	ISI-DISCONNECT PDU sent by a SwMI in case of call clearing or call rejection	73
6.1.2.17	TETRA PDUs specific for interaction with supplementary service protocol sent to the originating SwMI	73
6.1.2.18	ISI-QUEUING PDUs sent towards the terminating SwMI	74
6.1.2.19	ISI-RESOURCE PDU sent towards the Terminating SwMI	75
6.1.2.20	ISI-RESOURCE RESPONSE PDUs sent towards the Called or Originating SwMI after the call has connected	75
6.1.3	TETRA PDU information element coding	75
6.1.3.1	Introduction	75
6.1.3.2	Specific ISI definition of some information elements already defined for air interface messages	76
6.1.3.2.1	Basic service information	76
6.1.3.2.2	Call status	76
6.1.3.2.3	Call time-out, set-up phase	76
6.1.3.2.4	Disconnect cause information element	77
6.1.3.2.5	PDU type	78
6.1.3.3	New information elements used at the ISI	79
6.1.3.3.1	Call diverted to a dispatcher	79
6.1.3.3.2	Call has been forward switched	79
6.1.3.3.3	Call identified as fleet call	79
6.1.3.3.4	Called/forwarded-to external subscriber number	79
6.1.3.3.5	Called/forwarded-to party extension	79
6.1.3.3.6	Called/forwarded-to party SSI	79
6.1.3.3.7	Called/forwarded-to party fleet number SSI	79
6.1.3.3.8	Called/forwarded-to user having migrated	80
6.1.3.3.9	Calling external subscriber number	80
6.1.3.3.10	Calling external subscriber number parameters	80
6.1.3.3.11	Calling party fleet number SSI	80
6.1.3.3.12	Calling party presentation indicator	80
6.1.3.3.13	Cause for PDU addressed to originating SwMI	81

6.1.3.3.14	Connected external subscriber number	81
6.1.3.3.15	Connected external subscriber number parameters	81
6.1.3.3.16	Connected party presentation indicator	81
6.1.3.3.17	Connected party extension	81
6.1.3.3.18	Connected party SSI	81
6.1.3.3.19	Connected party fleet number SSI	82
6.1.3.3.20	Controlling SwMI	82
6.1.3.3.21	Incoming call barring status	82
6.1.3.3.22	Forwarded-to external subscriber number	82
6.1.3.3.23	Forwarded-to user extension	82
6.1.3.3.24	Forwarded-to user SSI	82
6.1.3.3.25	Last Forwarding SwMI MNI	82
6.1.3.3.26	Modify accepted	82
6.1.3.3.27	Modify request	83
6.1.3.3.28	MSISDN present as external subscriber number	83
6.1.3.3.29	New SwMI MNI	83
6.1.3.3.30	Number of digits in called/forwarded-to external subscriber number	83
6.1.3.3.31	Number of digits in calling external subscriber number	83
6.1.3.3.32	Number of digits in connected external subscriber number	83
6.1.3.3.33	Number of digits in forwarded-to external subscriber number	84
6.1.3.3.34	Number of digits in visited/forwarded-to SwMI PISN number	84
6.1.3.3.35	Originating SwMI MNI	84
6.1.3.3.36	Other end SwMI MNI	84
6.1.3.3.37	Override SS-CAD invocation	84
6.1.3.3.38	PDU addressed to originating SwMI	84
6.1.3.3.39	Possible ISI trombone or loop connection detected	84
6.1.3.3.40	Restoring party extension	85
6.1.3.3.41	Restoring party SSI	85
6.1.3.3.42	Resource release permission	85
6.1.3.3.43	Resource release signalling support	85
6.1.3.3.44	Resource indicator	85
6.1.3.3.45	Routeing method choice	86
6.1.3.3.46	Routeing method response	86
6.1.3.3.47	Security level at air interface	86
6.1.3.3.48	Setup resource allocation	86
6.1.3.3.49	Speech service requested/chosen/used	87
6.1.3.3.50	Speech services supported	87
6.1.3.3.51	SS-CF invocation counter	87
6.1.3.3.52	SS-CF invoked	87
6.1.3.3.53	SS-CLIR invoked for other party	87
6.1.3.3.54	Terminating SwMI MNI	87
6.1.3.3.55	Visited/forwarded-to SwMI MNI	88
6.1.3.3.56	Visited/forwarded-to SwMI PISN number	88
6.2	ANF-ISIIC state definitions	88
6.3	ANF-ISIIC signalling procedures	88
6.3.1	General	88
6.3.2	Call establishment	88
6.3.2.1	Call request and call proceeding	88
6.3.2.2	Called user migration	88
6.3.2.2.1	Introduction	88
6.3.2.2.2	Called user having migrated in SwMI C different from SwMI A	89
6.3.2.2.3	Called user having migrated in SwMI C coinciding with SwMI A	91
6.3.2.3	Call characteristics and set-up time negotiation by the terminating SwMI	92
6.3.2.4	Call through connection	92
6.3.2.4.1	Call confirmation indication by the terminating SwMI	92
6.3.2.4.2	Resource queuing and different resource allocation policies when no forward switching SwMIs involved	93
6.3.2.4.3	Resource queuing and different resource allocation policies if forward switching SwMIs are involved	95
6.3.2.5	Failure of call establishment	97
6.3.3	Call maintenance procedures	97
6.3.3.1	Transmission control procedures	97

6.3.3.2	Call modification	97
6.3.3.3	Call restoration	98
6.3.3.3.1	General call restoration procedure	98
6.3.3.3.2	Specific call restoration procedure in a SwMI already on the path of the call	99
6.3.4	DTMF procedures	100
6.3.5	ANF-ISIIC clearing	100
6.4	ANF-ISIIC impact of interworking with ISDN/PISN/PSTN	101
6.5	Protocol interactions between ANF-ISIIC and supplementary services and other ANFs	102
6.5.1	Interaction with SS-CLIR	102
6.5.2	Interactions with SS-CF	102
6.5.2.1	Interaction with SS-CF at call establishment	102
6.5.2.2	Specific interaction with SS-CFNRY at call establishment	103
6.5.2.3	Interaction with SS-CF at call restoration	103
6.5.3	Interaction with SS-CAD	104
6.5.3.1	Invocation of a specific ANF-ISIIC	104
6.5.3.2	Interception of an already invoked ANF-ISIIC	104
6.5.3.3	Call authorization by a distant dispatcher	104
6.5.3.4	Completion of call establishment	104
6.5.3.4.1	Call not diverted to dispatcher	104
6.5.3.4.2	Call diverted to dispatcher	104
6.5.4	Interactions with SS-PC, SS-PPC and SS-CRT	105
6.5.5	Interaction with SS-CW	105
6.5.6	Interaction with SS-HOLD	106
6.5.7	Interaction with SS-CCBS and SS-CCNR	106
6.5.8	Interaction with SS-BIC	106
6.5.9	Area Selection (SS-AS) and selected area number	106
6.5.10	Interactions with other supplementary services	106
6.6	ANF-ISIIC parameter values (timers)	106
Annex A (informative): Interactions of SS-CFU with ANF-ISIIC		107
A.1	Possible SS-CFU activation	107
A.2	Invocation and operation	107
A.2.1	Invocation	107
A.2.2	Called user home SwMI being SwMI A	107
A.2.3	Called user home SwMI being SwMI B	107
A.2.3.1	Introduction	107
A.2.3.2	Forwarded-to user with home SwMI being SwMI B, being registered in its home SwMI	108
A.2.3.3	Forwarded-to user with home SwMI being SwMI B, having migrated	109
A.2.3.4	Forwarded-to user with home SwMI different from SwMI B, being registered in its home SwMI	109
A.2.3.5	Forwarded-to user with home SwMI different from SwMI B, having migrated	109
Annex B (informative): Change Requests		112
History		113

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

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 12 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 present document is based on ETSI EN 300 392-3-2 "Interworking at the Inter-System Interface, Sub-part 2 Additional Network Feature for Individual Call (ANF-ISIIC)". The main changes are:

- Removal of any reference to the bearer protocol
- Clean up of stage 2 descriptions

For all sub-parts 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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document defines the Terrestrial Trunked Radio (TETRA) system supporting Voice plus Data (V+D). It specifies:

- the interworking of individual calls between TETRA networks;
- the supplementary services interaction with individual calls between TETRA networks.

The TETRA V+D interworking - basic operation 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 [2];
- General Design, PSS1 over E.1 [3];
- General Design, SIP/IP [4];
- Transport layer independent Additional Network Feature - ISI Individual Call (ANF-ISIIC) (the present document);
- Transport layer independent Additional Network Feature - ISI Group Call (ANF-ISIGC) [5];
- Transport layer independent Additional Network Feature - ISI Short Data service (ANF-ISISDS) [i.8];
- Transport layer independent Additional Network Feature - ISI Mobility Management (ANF-ISIMM) [6];
- Generic Speech Format Implementation [i.7].

The present document is the ANF-ISIIC sub-part.

Like all other Additional Network Feature (ANF) specifications, those of ANF-ISIIC are produced in three stages, according to the method described in Recommendation ITU-T I.130 [i.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 individual call control entities in both TETRA networks. The stage 2 description identifies the functional entities involved in the ANF and the information flows between them. And the stage 3 description of ANF-ISIIC specifies its protocol.

NOTE 1: According to Recommendation ITU-T I.130 [i.4], the stage 3 description of a bearer or tele-service addresses the network implementation aspects. Consequently, it comprises two steps: the specifications of all protocols at the various reference points involved in any of the service procedures (notably the service operation) are the first step of the stage 3 description, and the specifications of the functions of the corresponding network entities are its second step.

NOTE 2: The SDL diagrams have not been provided since they can be derived from the specification of the functional entity actions in the stage 2 description.

The present document applies to TETRA networks which support inter-TETRA individual calls. More specifically, it applies to their Circuit Mode Control Entities (CMCE), as defined in clause 14.2 of ETSI EN 300 392-2 [1], and to their ANF-ISIIC entities defined in the stage 2 description.

The relation between the ANF-ISIIC and the transport layer protocol is described in the General Design documents [2], [3] and [4].

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/>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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 100 392-3-9: "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".
- [3] 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".
- [4] 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".
- [5] ETSI TS 100 392-3-13: "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)".
- [6] 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)".
- [7] ETSI EN 300 392-9: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 9: General requirements for supplementary services".
- [8] ETSI EN 300 392-12-4: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary services stage 3; Sub-part 4: Call Forwarding (CF)".
- [9] ISO/IEC 11572: "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit mode bearer services - Inter-exchange signalling procedures and protocol".
- [10] 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)".

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.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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 300 392-7: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 7: Security".
- [i.2] ETSI EN 300 392-10-19: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 19: Barring of Incoming Calls (BIC)".
- [i.3] ETSI EN 300 395-2: "Terrestrial Trunked Radio (TETRA); Speech codec for full-rate traffic channel; Part 2: TETRA codec".
- [i.4] Recommendation ITU-T I.130: "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

- [i.5] ETSI TR 102 300-5: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Designers' guide; Part 5: Guidance on numbering and addressing".
- [i.6] ETSI EN 300 392-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 1: General network design".
- [i.7] 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".
- [i.8] ETSI TS 100 392-3-14: "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)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI TS 100 392-3-9 [2] and the following apply:

called SwMI: Switching and Management Infrastructure to which ANF-ISIIC routes the first call attempt

controlling SwMI: Switching and Management Infrastructure responsible of the speech item management in half duplex individual calls

NOTE: During the call setup the originating SwMI is also the controlling SwMI. When the calling party migrates during a call the control of the call is transferred to that SwMI.

fleet call: call to a closed user group using a Fleet Specific Short Number

NOTE: Refer to ETSI TR 102 300-5 [i.5], clause 5.4.3.

forward switching: network routing algorithm which performs the routing from SwMI A to SwMI C by joining together the first connection, from SwMI A to SwMI B, and a second connection from SwMI B to SwMI C

home SwMI: SwMI which is the home of the MS (or LS) ITSI, i.e. to which the Mobile Network Identity (MNI) which is part of the ITSI belongs

loop connection: ISI connection which has both its ends in the same SwMI

originating SwMI: Switching and Management Infrastructure in which the calling user has registered when the call is set up

re-routing: network routing algorithm which performs the routing from SwMI A to SwMI C by replacing the connection from SwMI A to SwMI B by another connection from SwMI A to SwMI C

SwMI A: Switching and Management Infrastructure in which the calling user has registered or in case of call forwarding SS where the call forwarding is performed

SwMI B: Switching and Management Infrastructure to which ANF-ISIIC of SwMI A routes the call attempt

SwMI C: Switching and Management Infrastructure in which the called user or the forwarded-to user has registered after having migrated from SwMI B, in the case where its home SwMI is SwMI B

terminating SwMI: Switching and Management Infrastructure in which the connected user is registered

NOTE: Unless an interaction with one or more supplementary services which modify the routing of the call (e.g. call forwarding) has occurred, the connected user will be the called user; and the terminating SwMI will be the SwMI where the called user is registered, i.e. SwMI B or SwMI C.

Transit SwMI: TETRA SwMI involved in a call but not being controlling or terminating SwMI

NOTE: A SwMI performing forward switching becomes a transit SwMI. Also in case of call restoration the old visited SwMI becomes a transit SwMI.

trombone connection: two inter-SwMI connections between two SwMIs for the same call

visited SwMI: TETRA network which MNI is not equal to the user's MNI

NOTE: In the present document the term visited SwMI follows the definition of the Air Interface standard ETSI EN 300 392-2 [1].

3.2 Abbreviations

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

AL	Ambience Listening
ANF	Additional Network Feature
AP	Access Priority
APDU	Application Packet Data Unit
AS	Area Selection
BIC	Barring of Incoming Calls
BOC	Barring of Outgoing Calls
CAD	Call Authorized by Dispatcher
CC	Call Control (PISN functional entity)
CCAp	Call Control Application (SwMI functional entity)
CCBS	Call Completion to Busy Subscriber
CCNR	Call Completion on No Reply
CF	Call Forwarding
CFB	Call Forwarding on Busy
CFNRc	Call Forwarding on Not Reachable
CFNRy	Call Forwarding on No Reply
CFU	Call Forwarding Unconditional
CLIP	Calling Line Identification Presentation
CLIR	Calling/connected Line Identification Restriction
CMCE	Circuit Mode Control Entities
COLP	COnnected Line identification Presentation
CR	Call Report
CRT	Call ReTention
CRV	Call Retention Value
CW	Call Waiting
DGNA	Dynamic Group Number Assignment
DL	Discreet Listening
DTMF	Dual Tone Multi Frequency
FE	Functional Entity
GTSI	Group TETRA Subscriber Identity
HOLD	Call Hold
IC	Include Call
ISDN	Integrated Services Digital Network
ISI	Inter System Interface
ISIGC	Inter System Interface Group Call
ISIIC	Inter System Interface Individual Call
ISIMM	Inter System Interface Mobility Management
ISISDS	Inter System Interface Short Data Service
ISISS	Inter System Interface Supplementary Service
ITSI	Individual TETRA Subscriber Identity
LE	Late Entry
LS	Line Station
LSC	List Search Call
MLE	Mobile Link Entity
MNI	Mobile Network Identity
MS	Mobile Station
MSISDN	Mobile Station Integrated Services Digital Network
PC	Priority Call