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Terrestrial Trunked Radio (TETRA);
Voice plus Data (V+D);
Part 12: Supplementary services stage 3;
Sub-part 4: Call Forwarding (CF)

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Foreword

This European Standard (EN) has been produced by ETSI Technical Committee TETRA and Critical Communications Evolution (TCCE).

The present document is part 12, sub-part 4 of a multi-part deliverable covering Voice plus Data (V+D), as identified below:

ETSI EN 300 392-1: "General network design";

ETSI EN 300 392-2: "Air Interface (AI)";

ETSI EN 300 392-3: "Interworking at the Inter-System Interface (ISI)";

ETSI ETS 300 392-4: "Gateways basic operation";

ETSI EN 300 392-5: "Peripheral Equipment Interface (PEI)";

ETSI EN 300 392-7: "Security";

ETSI EN 300 392-9: "General requirements for supplementary services";

ETSI EN 300 392-10: "Supplementary services stage 1";

ETSI EN 300 392-11: "Supplementary services stage 2";

ETSI EN 300 392-12: "Supplementary services stage 3";

ETSI EN 300 392-12-1: "Call Identification (CI)";

ETSI ETS 300 392-12-2: "Call Report (CR)";

ETSI EN 300 392-12-3: "Talking Party Identification (TPI)";

ETSI EN 300 392-12-4: "Call Forwarding (CF)";

ETSI ETS 300 392-12-5: "List Search Call (LSC)";

ETSI EN 300 392-12-6: "Call Authorized by Dispatcher (CAD)";

ETSI ETS 300 392-12-7: "Short Number Addressing (SNA)";

ETSI EN 300 392-12-8: "Area Selection (AS)";

ETSI ETS 300 392-12-9: "Access Priority (AP)";

ETSI EN 300 392-12-10: "Priority Call (PC)";

ETSI ETS 300 392-12-11: "Call Waiting (CW)";

ETSI EN 300 392-12-12: "Call Hold (HOLD)";

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ETSI EN 300 392-12-13: "Call Completion to Busy Subscriber (CCBS)";

ETSI EN 300 392-12-14: "Late Entry (LE)";

ETSI EN 300 392-12-16: "Pre-emptive Priority Call (PPC)";

ETSI EN 300 392-12-17: "Include Call (IC)";

ETSI EN 300 392-12-18: "Barring of Outgoing Calls (BOC)";

ETSI EN 300 392-12-19: "Barring of Incoming Calls (BIC)";

ETSI EN 300 392-12-20: "Discreet Listening (DL)";

ETSI EN 300 392-12-21: "Ambience Listening (AL)";

ETSI EN 300 392-12-22: "Dynamic Group Number Assignment (DGNA)";

ETSI EN 300 392-12-23: "Call Completion on No Reply (CCNR)";

ETSI ETS 300 392-12-24: "Call Retention (CRT)";

ETSI ETS 300 392-13: "SDL model of the Air Interface (AI)";

ETSI ETS 300 392-14: "Protocol Implementation Conformance Statement (PICS) proforma specification";

ETSI TS 100 392-15: "TETRA frequency bands, duplex spacings and channel numbering";

ETSI TS 100 392-16: "Network Performance Metrics";

ETSI TR 100 392-17: "TETRA V+D and DMO specifications";

ETSI TS 100 392-18: "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 TS 100 392-2 and those may be the latest version of the document.

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National transposition dates	
Date of adoption of this EN:	12 July 2016
Date of latest announcement of this EN (doa):	31 October 2016
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2017
Date of withdrawal of any conflicting National Standard (dow):	30 April 2017

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.

Introduction

The supplementary service stage 3 description is preceded by the stage 1 [2] and the stage 2 [3] description of the service, according to the method described in Recommendation ITU-T I.130 [i.4]. The stage 1 description specifies the service from the user's point of view. The stage 2 description identifies the functional capabilities of each SS and the information flows needed to support the supplementary service as specified in its stage 1 description. The present stage 3 description specifies the protocols at the air interface and at the various Inter-System Interfaces (ISI) to support each Supplementary Service.

NOTE: According to Recommendation ITU-T I.130 [i.4], the stage 3 description of any telecommunication 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. The latter 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 adds parameterisation functionality for a later activation.

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1 Scope

The present document specifies the stage 3 description of the Supplementary Services CFU Call Forwarding Unconditional, CFB Call Forwarding on Busy, CFNRy Call Forwarding on No Reply and CFNRc Call Forwarding on Not Reachable for the Terrestrial Trunked Radio (TETRA).

SS-CFU, SS-CFB, SS-CFNRy and SS-CFNRc are supplementary services which allow a served user to have a TETRA network send all or specific incoming calls addressed to the served user's TETRA number to another number.

Man-Machine Interface and charging principles are outside the scope of the present document.

The present document is applicable to Voice plus Data individual call or group call; some parts of the present document are applicable to SDS (Short Data Service); more specifically to the following entities:

- the MS of either the calling user or the called user during an individual call or a group call;
- the originating Switching and Management Infrastructure (SwMI) in an individual call or a group call;
- the group controlling SwMI for a group call;
- the terminating SwMI in an individual call;
- the interworking SwMI for an individual call.

The present document is based on the latest version of ECMA-174 [i.1]. Contrary to ECMA-174 [i.1], the present document does not define Call Deflection supplementary service and the present document distinguishes between the case of No Reply and the case of Not Reachable. Moreover, the present document defines the protocol in cases of group calls and of mobility not covered by ECMA-174 [i.1].

The present document also specifies additional signalling protocol requirements for the support of interactions at the ISI reference point, other supplementary services and ANFs. The present document is applicable to SwMIs that can interconnect to form a TETRA network.

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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 http://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 EN 300 392-10-4: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 4: Call Forwarding (CF)".

[3] ETSI EN 300 392-11-4: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 11: Supplementary services stage 2; Sub-part 4: Call Forwarding (CF)".

[4] ETSI EN 300 392-9: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 9: General requirements for supplementary services".

[5] ETSI EN 300 392-3-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 1: General design".

[6] ETSI EN 300 392-3-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 2: Additional Network Feature Individual Call (ANF-ISIIC)".

[7] ETSI EN 300 392-3-3: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 3: Additional Network Feature Group Call (ANF-ISIGC)".

[8] 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)".

[9] ETSI EN 300 392-10-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 1: Call Identification (CI)".

[10] ETSI EN 300 392-12-13: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary services stage 3; Sub-part 13: Call Completion to Busy Subscriber (CCBS)".

[11] ETSI EN 300 392-12-23: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary services stage 3; Sub-part 23: Call Completion on No Reply (CCNR)".

[12] ETSI EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[13] ETSI EN 300 195-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Supplementary service interactions; Part 1: Protocol specification".

[14] ETSI EN 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[15] ETSI EN 300 392-3-5: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 5: Additional Network Feature for Mobility Management (ANF-ISIMM)".

[16] ETSI EN 300 207-1 (V1.2.5): "Integrated Services Digital Network (ISDN); Diversion supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[17] Recommendation ITU-T E.164: "The international public telecommunication numbering plan".

[18] Recommendation ITU-T X.219: "Remote Operations: Model, notation and service definition".

[19] Recommendation ITU-T X.229: "Remote Operations: Protocol specification".

[20] Recommendation ITU-T X.217: "Information technology - Open Systems Interconnection - Service definition for the Association Control Service Element".

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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