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Storitve in protokoli za napredna omrežja (SPAN) – Preskušanje integracije omrežja med IN, PLMN in ISDN – 2. del: Proformi izjave o skladnosti izvedbe (ICS) in delne dodatne informacije za preskušanje izvedbe (IXIT) ter abstraktni preskušalni niz (ATS)

Services and Protocols for Advanced Networks (SPAN); Network Integration Testing between IN, PLMN and ISDN; Part 2: Implementation Conformance Statement (ICS), partial Implementation eXtra Information for Testing (IXIT) proformas and Abstract Test Suite (ATS)

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ICS:

33.040.40	Podatkovna komunikacijska omrežja	Data communication networks

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Technical Specification

Services and Protocols for Advanced Networks (SPAN); Network Integration Testing between IN, PLMN and ISDN; Part 2: Implementation Conformance Statement (ICS), partial Implementation eXtra Information for Testing (IXIT) proformas and Abstract Test Suite (ATS)

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 2 of a multi-part deliverable covering the Network Integration Testing between IN, PLMN and ISDN as identified below:

Part 1: "Test Suite Structure and Test Purposes (TSS&TP)";

Part 2: "Implementation Conformance Statement (ICS), partial Implementation eXtra Information for Testing (IXIT) proformas and Abstract Test Suite (ATS)".

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1 Scope

The present document specifies the Implementation Conformance Statement (ICS) and Implementation eXtra Information for Testing (IXIT) for Network Integration Testing (NIT) to verify the overall compatibility of for the most used IN services based on the CS3 and the INAP/CAP/ISUP interworking between the mobile and fix networks.

Network Integration Testing will assure that the appropriate requested features pass between an ISDN subscriber and the mobile subscriber across the national or international ISUP (ISUP V2) interface and the IN interfaces CAP/INAP.

2 References

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

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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[1] 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]".

[2] ISO/IEC 9646-1: "Information Technology-Open Systems Interconnection- Conformance testing methodology and framework, Part 1: General Concepts".

[3] ISO/IEC 9646-2: "Information Technology- Open Systems Interconnection- Conformance testing methodology and framework, Part 2: Abstract Test Suite Specification".

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[4] ISO/IEC 9646-3: "Information Technology- Open Systems Interconnection- Conformance testing methodology and framework, Part 3: The Tree and Tabular Combined Notation".

[5] ETSI TS 124 008: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 (3GPP TS 24.008 version 3.2.1 Release 1999)".

[6] ETSI TS 129 078: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3; CAMEL Application Part (CAP) specification (3GPP TS 29.078 version 4.0.0 Release 4)".

[7] ETSI EN 301 931-2 (V1.1.2): "Intelligent Network (IN); Intelligent Network Capability Set 3 (CS3); Intelligent Network Application Protocol (INAP); Protocol specification; Part 2: SCF-SSF interface".

[8] ITU-T Recommendation Q.1601: "Signalling system No. 7 - Interaction between N-ISDN and INAP CS2".

[9] Contribution to PIR 2.1: NETWORK INTEGRATION TESTING OF G_UMTS WITH GSM, PSTN AND ISDN; IN Test purposes; version 3.8, 07/09/2001.

[10] How to write nice TTCN – A Style Guide for the P1016 GSM_ISDN-ATS" (MINIT-31-CH04c, Project P1016).

[11] ISO/IEC 7776: "Information technology - Telecommunications and information exchange between systems - High-level data link control procedures - Description of the X.25 LAPB-compatible DTE data link procedures".

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[12] ISO/IEC 8208: "Information technology - Data communications - X.25 Packet Layer Protocol for Data Terminal Equipment".

[13] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[14] ISO/IEC 9646-4: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".

[15] ITU-T Recommendation H.221: "Frame structure for a 64 to 1 920 kbit/s channel in audiovisual teleservices".

[16] ITU-T Recommendation H.242: "System for establishing communication between audiovisual terminals using digital channels up to 2 Mbit/s".

[17] ITU-T Recommendation V.110: "Support by an ISDN of data terminal equipments with V-Series type interfaces".

[18] ITU-T Recommendation X.30: "Support of X.21, X.21 bis and X.20 bis based Data Terminal Equipments (DTEs) by an Integrated Services Digital Network (ISDN)".

[19] ITU-T Recommendation F.182: "Operational provisions for the international public facsimile service between subscribers with Group 3 facsimile terminals (Telefax 3)".

3 Definitions

For the purposes of the present document, the following terms and definitions apply.

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3.1 Definitions related to conformance testing

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Abstract Test Case (ATC): Refer to ISO/IEC 9646-1 [2].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [2].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [2].

lower tester: Refer to ISO/IEC 9646-1 [2].

Implementation Conformance Statement (ICS) proforma: Refer to ISO/IEC 9646-1 [2].

Implementation eXtra Information for Testing (IXIT) proforma: Refer to ISO/IEC 9646-1 [2].

Point of Control and Observation (PCO): Refer to ISO/IEC 9646-1 [2].

Protocol Implementation Conformance Statement (PICS): Refer to ISO/IEC 9646-1 [2].

Protocol Implementation eXtra Information for Testing (PIXIT): Refer to ISO/IEC 9646-1 [2].

System Under Test (SUT): Refer to ISO/IEC 9646-1 [2].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [2].

3.2 Definitions related to test purpose descriptions

BC=speech: Bearer capability information element with its information transfer capability field set to "speech" and its user information layer one protocol field set to "G.711 A-law" [2]

BC=3,1 kHz audio: Bearer capability information element with its information transfer capability field set to "3,1 kHz Audio" and its user information layer one protocol field set to "G.711 A-law" [3]

BC=UDI: Bearer capability information element with its information transfer capability set to "unrestricted digital information" [1]

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BC=UDI/TA: Bearer capability information element with its information transfer capability set to "unrestricted digital information with tones/announcements" and its user information layer one protocol field set to "Recommendations H.221 and H.242" [4]

BC= V110/X30: Bearer capability information element with its information transfer capability set to "unrestricted digital information" and its user information layer 1 field set to "ITUstandardised rate adaption V.110/X.30", including sync/async and user rate values [1]

HLC=telephony: High Layer compatibility information element with its high layer characteristics identification field set to "telephony" [28]

HLC=videotelephony_ic: High Layer compatibility information element with its high layer characteristics identification field set to "videotelephony (Recommendation F.721)" and its extended audiovisual characteristics field set to "capability set of initial channel of Recommendation H.221" [4]

HLC = Facsimile G2/G3: High Layer compatibility information element with its high layer characteristics identification field set to "facsimile group 2/3 (Recommendation F.182)" [1]

HLC=facsimile group 4: High Layer compatibility information element with its high layer characteristics identification field set to "facsimile group 4 class 1" [1], [5]

HLC=telex: High Layer compatibility information element with its high layer characteristics identification field set to "telex" [1]

LLC=telematic_term: Low Layer compatibility information element with its user information layer 2 field indicating "ISO/IEC 7776 DTE-DTE operation" and user information layer 3 field indicating "ISO/IEC 8208" [1], [5]

LLC=voice band data via modem: Low Layer compatibility information element with its user information layer 1 field indicating a "modem type" coding [1]

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LLC = V110/X30: Low Layer compatibility information element with its user information layer 1 field indicating "ITUstandardised rate adaption V.110/X.30" and including sync/async and user rate values [6]

SI=UPVP: Screening Indicator forwarded to the served user coded as "User-provided, verified and passed"

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SI=NP: Screening Indicator coded as "Network provided" [1]

PI=PR: Presentation Indicator coded as "Presentation restricted" [1]

TON=international: Type of number coded as "international" [1]

TON=unknown: Type of number coded as "unknown" [1]

NPI=unknown: Numbering plan identification coded as "unknown" [1]

CUG default request: calling user do not include in the outgoing SETUP message a explicit request for the CUG supplementary service [11]

UI length=32: the length of the User information field of the User-user information element is 35 octets

CF active: call forwarding (U, B or NR) supplementary service is already activated with the address of user C [17]

GSM - Bearer service categories: All bearer service categories provide information transfer between R/S reference points and allow the use of sub-rate information streams which are rate adapted

GSM-BC=UD: Unrestricted Digital Information (UD); Provides the transfer of unrestricted digital information.

GSM-BC= 3,1 kHz (External to the PLMN): used to select a "3,1 kHz audio" interworking function at the MSC

NOTE: This service category is used when interworking with the ISDN or PSTN "3,1 kHz audio" service and includes the capability to select a modem at the interworking function. "External to the PLMN" indicates that the "3,1 kHz audio" service is only used outside of the PLMN, in the ISDN/PSTN. The connection within the PLMN, user access point to the interworking function, is an unrestricted digital connection.

Alternate Speech/Data: provides the capability to swap between speech and data during a call

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If either the speech or data portion of the call requires a full rate channel, a full rate channel shall be used for the duration of the call.

The access interface at the mobile station for the data portion is assumed to be a standard data interface. Some means must be provided to select the speech/data capability.

Speech followed by Data: provides a speech connection first and then at some time while the call is in progress, the user can switch to a data connection
The user cannot switch back to speech after the data portion. If either the speech or data portion of the call requires a full rate channel, a full rate channel shall be used from the start of the call. The network may then change to a half rate channel for the data portion.

GSM teleservices: teleservices supported by a GSM PLMN are described by a number of attributes which are intended to be largely independent. They are grouped into five categories:

- High layer attributes;
- Low layer attributes (describing the Bearer capabilities which support the Teleservice);
- Information transfer attributes;
- Access attributes;
- General attributes.

GSM-BC= Speech (TS 11): this service provides the transmission of speech information and audible signalling tones of the PSTN/ISDN
In the GSM PLMN and the fixed network processing technique appropriate for speech such as analogue transmission, echo cancellation and low bit rate voice encoding may be used.

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Alternate speech and facsimile group 3 (TS 61): this Teleservice allows the connection of ITUgroup 3 fax apparatus (send and/or receive) to the mobile stations of a GSM PLMN
Facsimile connections may be established to/from group 3 apparatus in the PSTN, ISDN or GSM PLMN.

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Automatic Facs. group 3 (TS 62): this teleservice allows connection of ITUgroup 3 fax apparatus to and from the mobile stations of a GSM PLMN
Facsimile connections may be established to and from group 3 apparatus in the PSTN, ISDN or GSM PLMN.

4 Abbreviations

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

3PTY	Three-ParTY conference
ATS	Abstract Test Suite
BC	Bearer Capability information element
BSC	Base Station Controller
BSS	Base Station Sub-system
BSS	Base Station System
CAMEL	Customized Applications for Mobile network Enhanced Logic
CD	Call Deflection
CFB	Call Forwarding Busy
CFU	Call Forwarding Unconditional
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	COnnected Line identification Presentation
COLR	COnnected Line identification Restriction
CONF	CONFerence (add-on)
CUG	Closed User Group
CW	Call Waiting
ECT	Explicit Call Transfer
FPH	FreePHone service
GSM	Global System for Mobile Communication

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HLC	High Layer Compatibility information element
HPLMN	Home Public Land Mobile Network
IMSI	International Mobile Subscriber Identity
IN	Intelligent Network
INAP	Intelligent Network Application Part
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
IUT	Implementation Under Test
IXIT	Implementation eXtra Information for Testing
LLC	Low Layer Compatibility information element
MAP	Mobile Application Part
MCID	Malicious Call IDentification
MS	Mobile Station
MS	Mobile Subscriber
MSC	Mobile Switching Center
MT	Mobile Terminal
MT	Mobile Terminated
MTC	Mobile Terminated Call
MTP	Message Transfer Part
NIT	Network Integration Testing
PC	Preferential CUG
PI	Presentation Indicator
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PLMN	Public Land Mobile Network
PSTN	Public Switched Telephone Network
SCCP	Signaling Connection and Control Part
SCF	Service Control Function
SCP	Service Control Point
SGSN	Serving GPRS Support Node
SI	Screening Indicator
SMS	Short Message Service
SS7	Signaling System number 7
SSP	Service Switching Point
SUB	SUBaddressing
TCAP	Transaction Capabilities Application Part
TON	Type Of Number
TP	Terminal Portability
TP	Test Plant
TSS	Test Suite Structure
TSS&TP	Test Suite Structure and Test Purposes
UD	Unrestricted Digital information
UMTS	Universal Mobile Telecommunications System
UUS	User-to-User Signalling
VLR	Visitor Location Register
VPLMN	Visited Public Land Mobile Network

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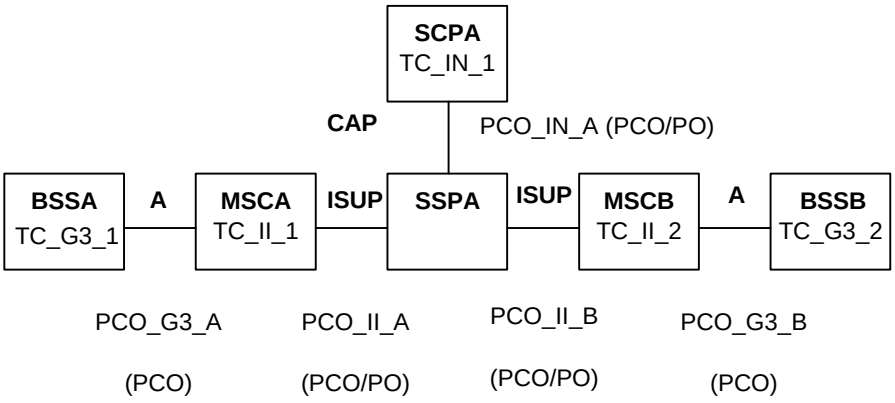
5 Test Configurations

Three different test configurations have been defined, which were mapped into abstract test configurations (Test Suite Configuration Declarations) as shown in the following figures:

Configuration 1 (GSM_II_IN_II_GSM):



Configuration 2 (GSM_II_IN__IN_II_GSM):

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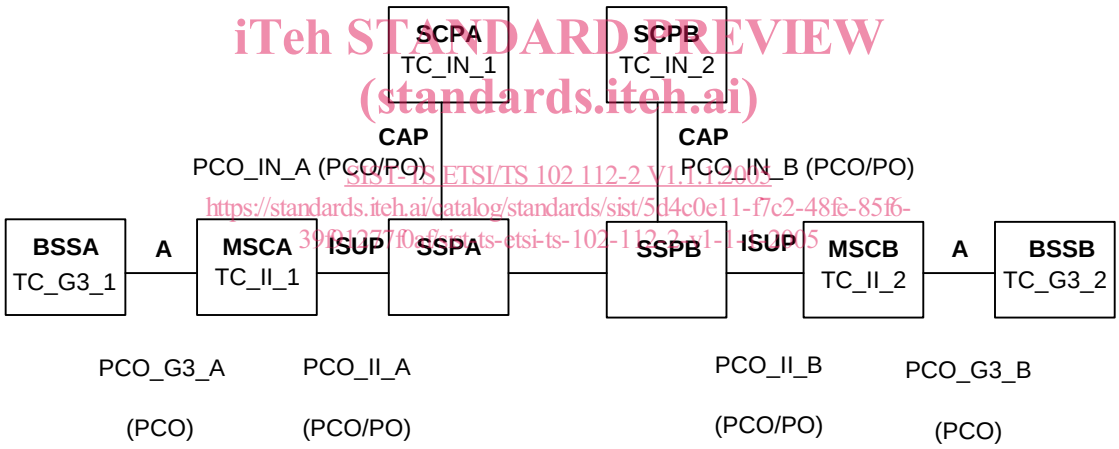

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NOTE 1: The configuration is used in test case GG_SPN_04.
NOTE 2: The inter-SSP link is regarded as internal.
NOTE 3: The PCO_IN_A and PCO_IN_B have to be configured identically (both used as PCO or both used as PO).

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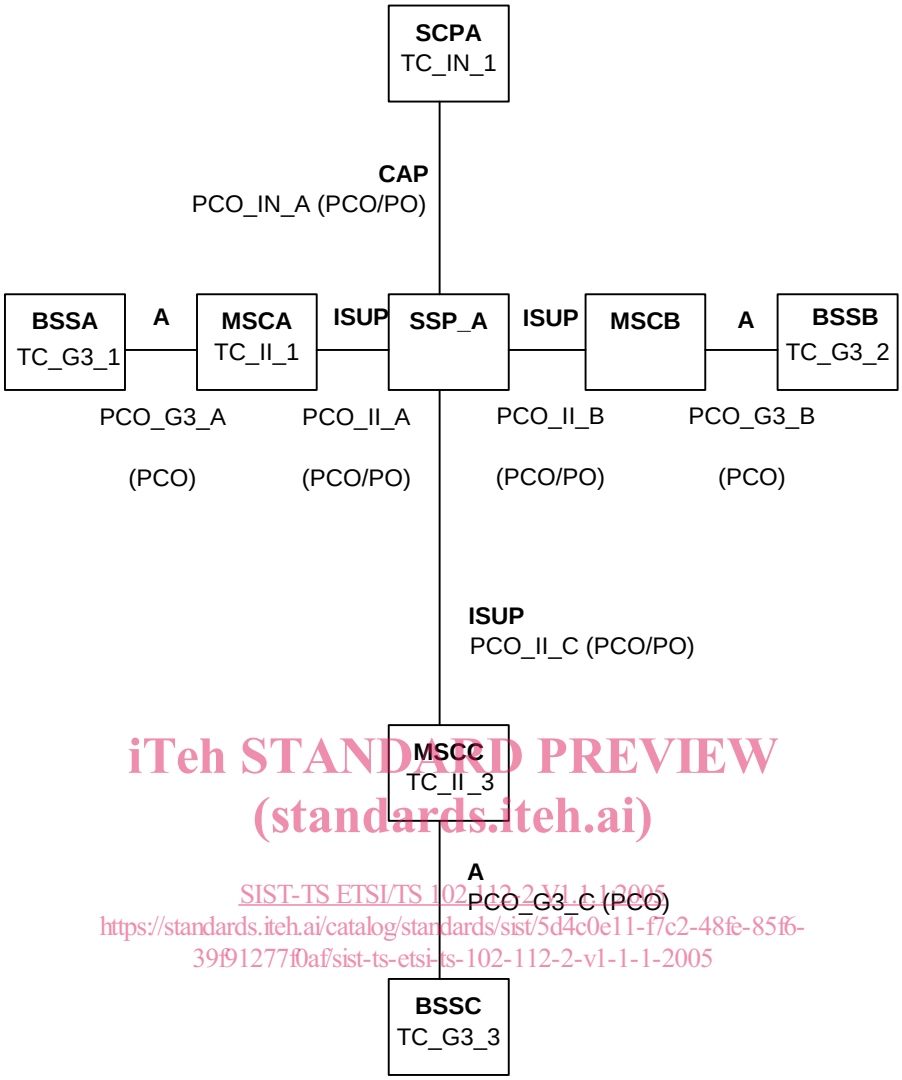
Configuration 3 (GSM_II_IN_II_GSM_II_GSM):



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NOTE 1: The configuration is used for test cases GG___SPN_06, GGG__SPNS_CFU_01, GGG__SPNS_CFNRY_02, GGG_SPNS_CFNRC_03 and GGGG_SPNS_CFB_01.

NOTE 2: PCO_II_B is only used for test case GG___SPN_06. For all CFxx test cases PCO_G3_B is used as an auxiliary test interface to activate and deactivate call forwarding supplementary services and to trigger the service itself.

NOTE 3: Depending on the value of Test Suite Parameter P_IN_PCO_Definition the test configuration can be modified in such a way that the test interfaces become PCO"s or PO"s respectively. The following tables summarises the possible configurations: