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SIST EN 301 005-3:2001

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Vmesniki V digitalnega storitvenega vozliġ a (SN) - Vmesniki v referenį ni toį ki VB5.1 za podporo ġirokopasovnega ali kombiniranega ozkopasovnega in ġirokopasovnega dostopovnega omreġja (AN) - 2. del: Zgradba preskuġalnega niza in namen preskuġanja - Specifikacija

V interfaces at the digital Service Node (SN); Interfaces at the VB5.1 reference point for the support of broadband or combined narrowband and broadband Access Networks (ANs); Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification

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V interfaces at the digital Service Node (SN); Interfaces at the VB5.1 reference point for the support of broadband or combined narrowband and broadband Access Networks (ANs); Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Signalling Protocols and Switching (SPS).

The present document is part 3 of a multi-part EN covering the V interfaces at the digital Service Node (SN); Interfaces at the VB5.1 reference point for the support of broadband or combined narrowband and broadband Access Networks (ANs) as identified below:

Part 1: "Interface specification";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification".

National transposition dates	
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Introduction

General

The work on a new broadband VB reference point concept was initiated by ETSI Technical Committee SPS to consider possible new structures and reference points for the connection of new broadband and combined narrowband/broadband access arrangements to Service Nodes (SN), in co-operation with other TCs.

The VB5 reference point concept, based on ITU-T Recommendation G.902 [5], was split into two variants. The first variant based on an ATM cross-connect with provisioned connectivity, called the VB5.1 reference point, is described in the present document. The other variant which further enables on-demand connectivity within the AN, called the VB5.2 reference point, is covered by EN 301 217-1 [7].

Relationship between the VB5.1 and VB5.2 reference point concepts

VB5.2 extends the capabilities at the VB5.1 reference point to include on-demand connectivity in the AN under the control of SN. The major common features between the VB5.1 and VB5.2 interfaces are:

- both VB5 interfaces support B-ISDN as well as narrowband and other non-B-ISDN customer access types;
- both VB5 interfaces support ATM multiplexing/cross-connecting in the AN at the VP and/or VC level.

It is anticipated that the Real Time Management Co-ordination (RTMC) protocol for the VB5.1 reference point will be a subset of the RTMC protocol for the VB5.2 reference point.

1 Scope

The present document specifies the Test Suite Structure and Test Purposes (TSS&TP) and an example of test architecture for testing the conformity of an implementation to the specification of interfaces at the VB5.1 reference point between an Access Network (AN) and a Service Node (SN).

The test architecture proposed here is used for the design of the Message Sequence Charts (MSCs) produced as test purpose documentation.

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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ETSI EN 301 005-1 (V1.1): "V interfaces at the digital Service Node (SN); Interfaces at the VB5.1 reference point for the support of broadband or combined narrowband and broadband Access Networks (ANs); Part 1: Interface specification".

[2] ETSI EN 301 005-2 (V1.1): "V interfaces at the digital Service Node (SN); Interfaces at the VB5.1 reference point for the support of broadband or combined narrowband and broadband Access Networks (ANs); Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[3] ISO/IEC 9646-1: "Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[4] ISO/IEC 9646-2: "Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification".

[5] ITU-T Recommendation G.902: "Framework Recommendation on functional access networks (AN) - Architecture and functions, access types, management and service node aspects".

[6] ITU-T Recommendation M.3010: "Principles for a Telecommunications management network".

[7] ETSI EN 301 217-1: "V interfaces at the digital Service Node (SN); Interfaces at the VB5.2 reference point for the support of broadband or combined narrowband and broadband Access Networks (ANs); Part 1: Interface specification".

3 Definitions and abbreviations

3.1 Definitions

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

- terms defined in EN 301 005-1 [1];
- terms defined in ISO/IEC 9646-1 [3] and in ISO/IEC 9646-2 [4].

In particular, the following terms defined in ISO/IEC 9646-1 [3] apply:

- Abstract Test Suite (ATS);
- Implementation Under Test (IUT);
- System Under Test (SUT);
- Protocol Implementation Conformance Statement (PICS).

3.2 Abbreviations

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

AAL	ATM Adaptation Layer
AAL-SAP	AAL - Service Access Point
AN	Access Network
ATM	Asynchronous Transfer Mode
B-ISDN	Broadband ISDN
B-ISUP	Broadband ISDN Signalling User Part
B-UNI	Broadband UNI
BA	Basic (rate) Access
CPE	Customer Premises Equipment
CPN	Customer Premises Network
ET	Equipment Terminal
FSM	Finite State Machine
ID	Identity
IE	Information Element
INI	Inter-Network Interface
ISDN	Integrated Services Digital Network
LAN	Local Area Network
LE	Local Exchange
LME	Layer Management Entity
LMI	Local Management Interface
LSP	Logical Service Port
LUP	Logical User Port
MIB	Management Information Base
MSC	Message Sequence Chart
N-ISDN	Narrowband ISDN
NNI	Network-to-Network Interface
OAM	Operations Administration and Maintenance
PDH	Plesiochronous Digital Hierarchy
PDU	Protocol Data Units
PSP	Physical Service Port
PSTN	Public Switched Telephone Network
PUP	Physical User Port
Q3	"Q" management interface reference point as ITU-T Recommendation M.3010 [6]
RTMC	Real Time Management Co-ordination
SAAL	Signalling ATM Adaptation Layer
SAP	Service Access Point
SAR	Segmentation and Reassembly
SDH	Synchronous Digital Hierarchy
SDL	Specification and Description Language
SDU	Service Data Units
SN	Service Node
SNI	Service Node Interface
SP	Service Port
SPS	Signalling Protocols and Switching
SSCF	Service Specific Co-ordination Function
SSCOP	Service Specific Connection Oriented Protocol
TC	Technical Committees

TE	Terminal Equipment
TMN	Telecommunications Management Network
TP	Transmission Path
UNI	User-Network Interface
VB	Broadband "V" reference point
VC	Virtual Channel (ATM)
VCE	Virtual Channel Entity
VP	Virtual Path
VPC	VP Connection
VPCI	VP Connection Identifier
VPCI-CC	VP Connection Identifier - Consistency Check
VPI	VP Identifier
VPL	VP Link

4 Test Suite Structure

Figure 1 shows the structure of the V5.1 RTMC test suite when the AN is the IUT.

Figure 2 shows the structure of the V5.1 RTMC test suite when the SN is the IUT.

The first level is structured according to the RTMC procedures. The second level is structured according to test category. The meaning of the codes in the tree is given in subclause 5.2.

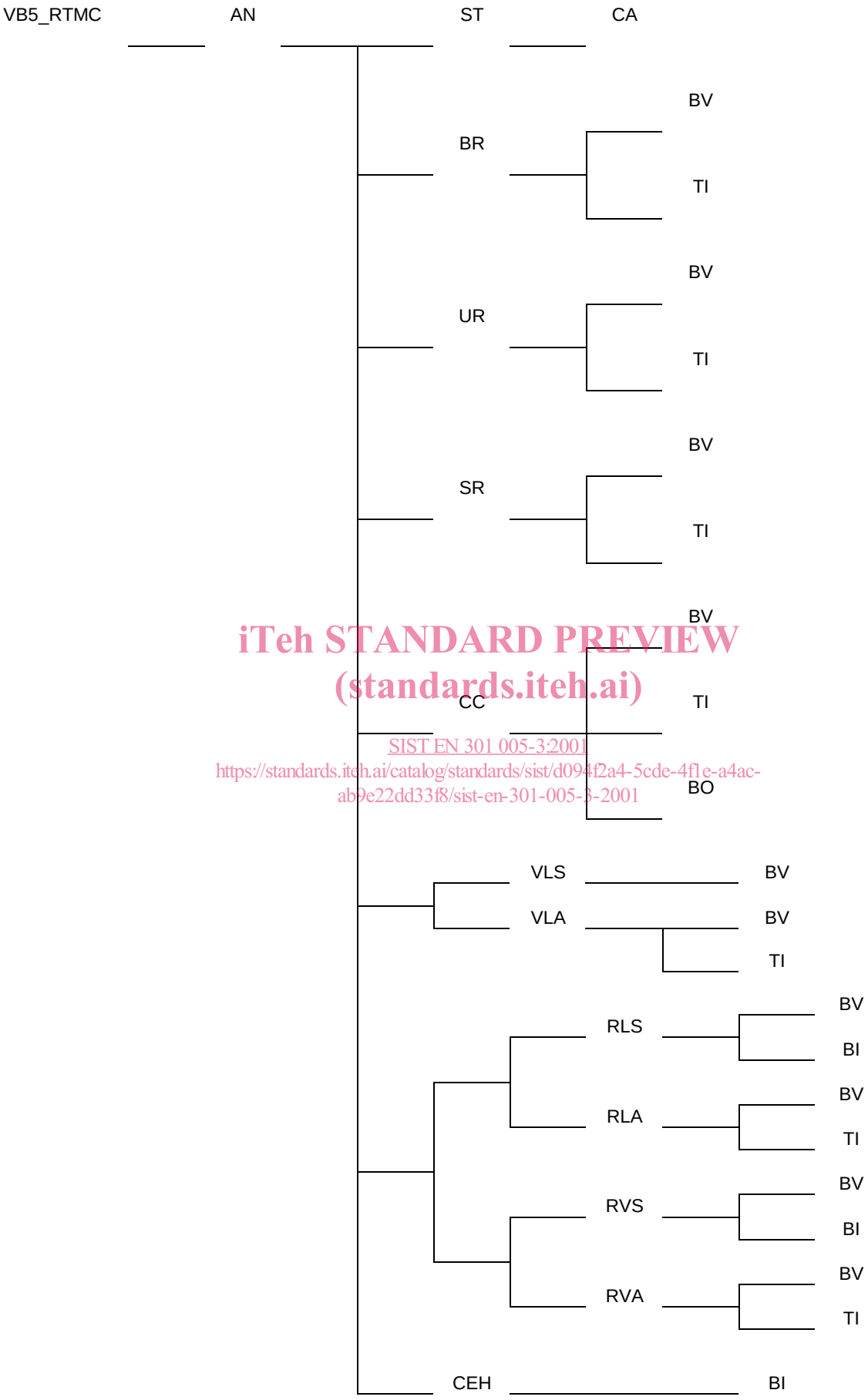

Figure 1: VB5 RTMC AN TSS

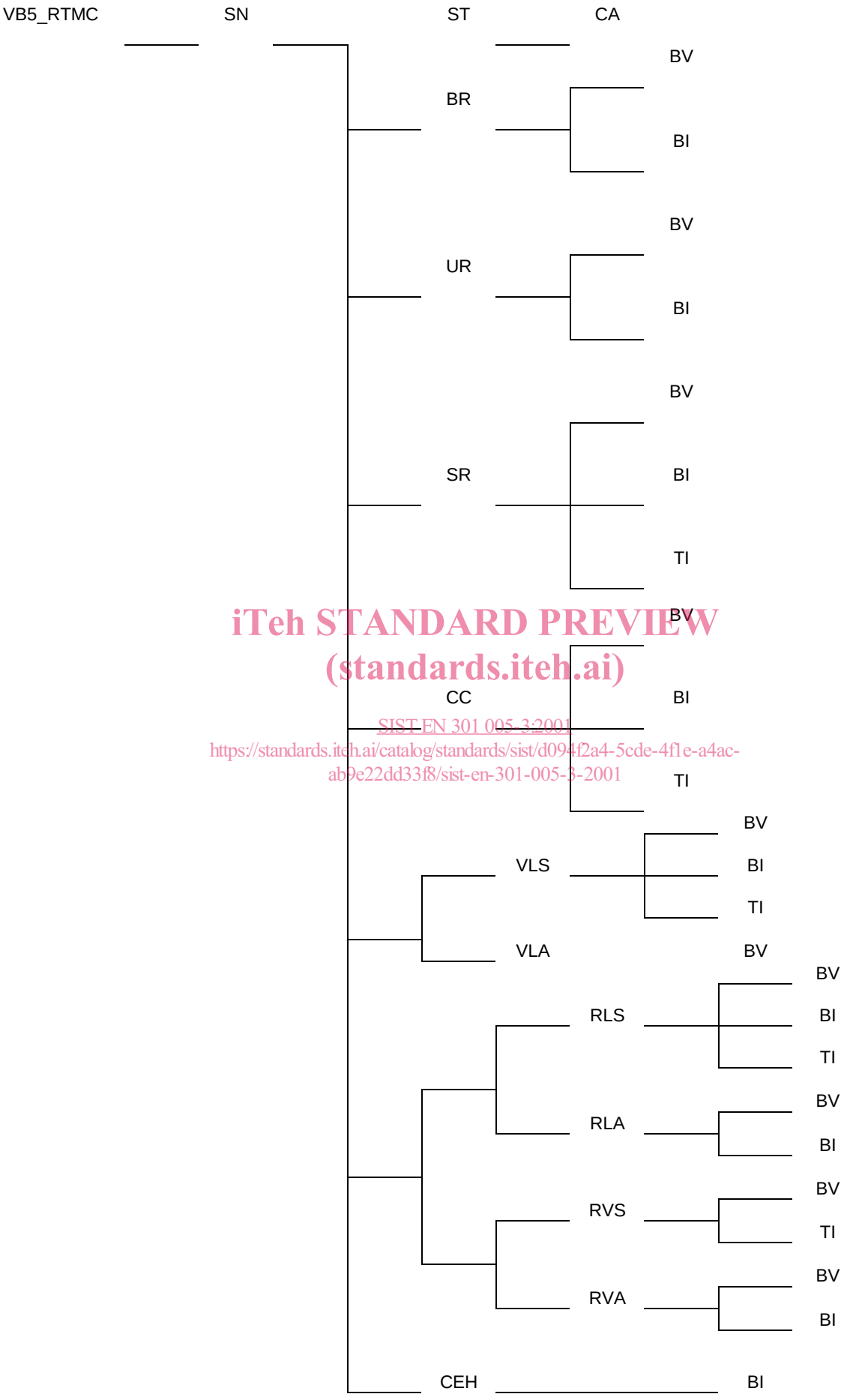

Figure 2: VB5 RTMC SN TSS

Invalid behaviour of the tester comprises: reference to unknown resources, unknown message type, errors in common message fields (protocol discriminator, transaction identifier, message length).

RTMC timer tests and inopportune behaviour tests are related to a number of specific RTMC procedures and the test suite has been structured accordingly.

5 Test Purposes description and naming

5.1 Method used for the description of the TPs

Each TP is described using textual information presented in a table. This table is followed by an MSC representing the test scenario.

The table describing each TP is as follows:

TP-Name is a unique identifier, created according to the TP naming conventions (also the name of the corresponding test case)	**Reference to the paragraph number of specification EN 301 005-1 [1] stating the conformance requirement**
Purpose	Purpose of the test performed against a requirement of the protocol.
Test description	Information on the test body, describing actions and parameters
Pass criteria	Visible action to be observed at PCO to declare that the IUT passes the test and conforms to the specifications
Selection	"None" or expression based on EN 301 005-2 [2] PICS statements, used to select or deselect the corresponding test case according to the options of the implementation.
Preamble	"None" or name of the preamble procedure bringing the IUT from idle state to the state required to run the test.
Postamble	"None" or name of the postamble to bring the IUT back to idle state.
Additional testing	Additional information, present in specification, for possible informal testing beyond RTMC protocol (for instance, if tester is capable of observation/action via additional interface like Q3 or signalling interfaces)

An MSC follows each TP tabulated description. The MSC is produced by exercising the SDL model, whenever possible, i.e. each time the function or procedure is modelled. These MSCs are then validated and are verified in accordance with the specification. If the procedure is not modelled, then the corresponding MSC is drawn manually and cannot be validated.

The columns identified in the MSC represent, from left to right, the IUT environment, the tester, the lower layer interface relevant only when starting the test itself, and the IUT.

As an MSC is focusing on the body of the test, the preamble is represented by a single line in the MSC.

Each following line represents an exchange of PDU at the VB5 interface, and shows the modelled parameters most relevant for a given test purpose. The values of these parameters are either mandatory and imposed by the specifications, or they are informative only and chosen arbitrarily in ranges compatible with the specifications.

The list of the informative parameters, for which a value is to be assigned by the implementer of the IUT for the execution of a test suite, is included in the PIXIT proforma of the RTMC protocol.

Annex A of the present document contains a copy of this PIXIT proforma parameter table. This proforma table is filled up and contains the parameter values used for the definition of the MSCs and TPs.

5.2 Test purpose naming convention

The identifier of the TP is built according to the following scheme.

Table 1: TP identifier naming convention scheme

Identifier: **VB5_<i>_<IUT>_<pp>_<cc>_<nn>**

VB5 VB5.1 reference point specification

<i> RTMC protocol at interface

<IUT> AN Access Network is the IUT
SN Service Node is the IUT

<pp> = procedure identifier like

ST	StartUp
BR	Blocking Resource
UR	Unblocking Resource
SR	Shut down Resource
CC	VPCI Consistency Check
VLS	Verify LSPId (SN initiated)
VLA	Verify LSPId (AN initiated)
RLS	Reset LSPId (SN initiated)
RLA	Reset LSPId (AN initiated)
RVS	Reset VPC (SN initiated)
RVA	Reset VPC (AN initiated)
CEH	Common Error Handling

<cc> = test category:

CA	Capability tests
BV	Valid Behaviour tests
BI	Invalid Behaviour tests
BO	Inopportune Behaviour tests
TI	Timer tests

<nn> = sequential number: (01-99)

Example of test purpose and test case name: **VB5_RTMC_AN_CC_BV_02**

5.3 Preambles and postambles

5.3.1 Preamble descriptions

The preambles are used to bring the IUT from power-on state to the correct state where a test can take place. They differ whether the IUT is an AN or an SN.

5.3.1.1 AN is the IUT

Startup_AN: initializes and starts the AN configuration (all resources unblocked).