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Širokopasovna radijska dostopovna omrežja (BRAN) – Zelo zmogljivo radijsko lokalno omrežje (HIPERLAN), tip 2 – Specifikacija za preskušanje skladnosti protokola krmiljenja podatkovnih povezav (DLC) – 1. del. Funkcija za prenos osnovnih podatkov – 3. poddel: Abstraktni preskušalni niz (ATS) – Specifikacija

Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Conformance testing for the Data Link Control (DLC) protocol; Part 1: Basic data transport function; Sub-part 3: Abstract Test Suite (ATS) specification

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Keywords
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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Broadband Radio Access Networks (BRAN).

The present document is sub-part 3 of a multi-part deliverable covering Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Conformance testing for the Data Link Control (DLC) protocol; Part 1: Basic data transport function, as identified below:

Sub-part 1: "Protocol Implementation Conformance Statement (PICS) proforma";

Sub-part 2: "Test Suite Structure and Test Purposes (TSS&TP) specification";

Sub-part 3: "Abstract Test Suite (ATS) specification".

National transposition dates	
Date of adoption of this EN:	19 January 2001
Date of latest announcement of this EN (doa):	30 April 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 October 2001
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1 Scope

The present document contains the Abstract Test Suite (ATS) to test the BRAN HIPERLAN Type 2; Data Link Control (DLC) protocol; Part 1: Basic data transport functions [1].

The objective of the present document is to provide a basis for conformance tests for HIPERLAN Type 2 equipment giving a high probability of air interface inter-operability between different manufacturers' HIPERLAN Type 2 equipment.

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [3] and ISO/IEC 9646-2 [4]) as well as the ETSI rules for conformance testing (ETS 300 406 [2]) are used as a basis for the test methodology.

Annex A provides the Tree and Tabular Combined Notation (TTCN) part of the ATS.

Annex B provides the Partial Protocol Implementation Extra Information for Testing (PIXIT) Proforma of the MT side ATS.

Annex C provides the Partial Protocol Implementation Extra Information for Testing (PIXIT) Proforma of the AP side ATS.

Annex D provides the Protocol Conformance Test Report (PCTR) Proforma of the MT side ATS.

Annex E provides the Protocol Conformance Test Report (PCTR) Proforma of the AP side ATS.

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 TS 101 761-1 (V1.1.1): "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Data Link Control (DLC) Layer; Part 1: Basic Data Transport Functions".

[2] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[3] ISO/IEC 9646-1 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts". (See also ITU-T Recommendation X.290 (1991)).

[4] ISO/IEC 9646-2 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification". (See also ITU-T Recommendation X.291 (1991)).

[5] ISO/IEC 9646-3 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)". (See also ITU-T Recommendation X.292 (1992)).

[6] ISO/IEC 9646-6 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".

[7] ISO/IEC 9646-7 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[8] ETSI TS 101 823-1-2 (V1.1.1): "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Conformance Testing for the Data Link Control (DLC) protocol; Part 1: Basic data Transport function; Sub-part 2: Test Suite Structure and Test Purposes (TSS&TP) specification".

3 Definitions and abbreviations

3.1 Definitions

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

a) The terms defined in ISO/IEC 9646-7 [7]; and

b) the definitions in TS 101 761-1 [1].

3.2 Abbreviations

For the purposes of the present document, the abbreviations defined in ISO/IEC 9646-1 [3], ISO/IEC 9646-6 [6], ISO/IEC 9646-7 [7], the abbreviations defined in TS 101 761-1 [1] apply. In particular, the following abbreviations apply:

AP	Access Point
ARQ	Automatic Repeat Request
ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
BCH	Broadcast CHannel
BI	Invalid Behaviour
BO	inOpportune Behaviour
BV	Valid Behaviour
CA	CApability tests
CC	Central Controller
CL	Convergence Layer
DLC	Data Link Control
DUC	DLC User Connection
DCC	DLC user Connection Control
DM	Direct Mode
EC	Error Control
IUT	Implementation Under Test
LT	Lower Tester
MAC	Medium Access Control
MAC-ID	MAC IDentifier
MT	Mobile Terminal
MTC	Main Test Component
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PDU	Protocol Data Unit
PHY	PHYsical layer
PICS	Protocol Implementation Conformance Statement
RLC	Radio Link Control
SAP	Service Access Point
SCH	Short CHannel
SUT	System Under Test
TC	Test Cases
TSS	Test Suite Structure
TP	Test Purposes
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

4 Abstract Test Method (ATM)

This clause describes the ATM used to test the HIPERLAN 2 U-plane layer at the AP side and at the MT side.

4.1 Test architecture

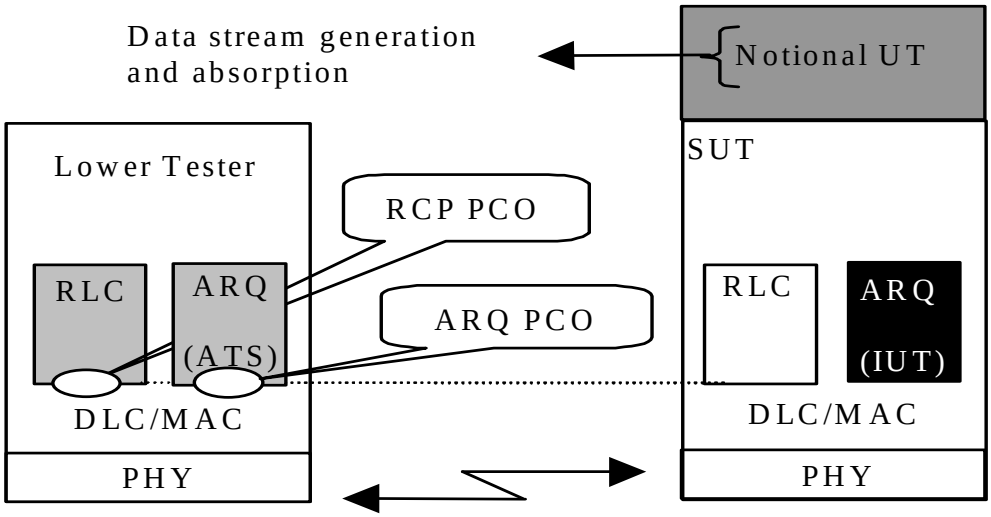

Figure 1: Test architecture for Error Control (RLC needed for association, etc.)

A single-party testing concept is used, which consists of the following abstract testing functions:

Lower Tester: A Lower Tester (LT) is located in the remote BRAN H/2 test system. It controls and observes the behaviour of the IUT.

ARQ ATS: An ARQ Abstract Test Suite (ATS) is located in the remote BRAN H/2 test system.

ARQ PCO: The Point of Control and Observation (PCO) for ARQ testing is located at a SAP between the Error Control layer and the MAC layer. All test events at the PCO are specified in terms of Abstract Testing Service Primitives defined in Clause 7 and containing complete PDU. To avoid the complexity of data fragmentation and recombination testing, the SAP is defined below these functions.

RCP PCO: The Point of Control and Observation (PCO) for RLC testing is located at a SAP between the RLC layer and the MAC layer. All test events at the PCO are specified in terms of Abstract Testing Service Primitives defined in Clause 7 and containing complete PDU. To avoid the complexity of data fragmentation and recombination testing, the SAP is defined below these functions.

Notional UT: No explicit upper tester (UT) exists in the system under test. Nevertheless, some specific actions to cover implicit send events and to obtain feedback information are necessary for the need of the test procedures. A black box covering these requirements is used in the SUT as a notional UT as defined in ISO 9646 ([3] to [7]). This notional UT is part of the test system.

4.2 Error control service model for testing

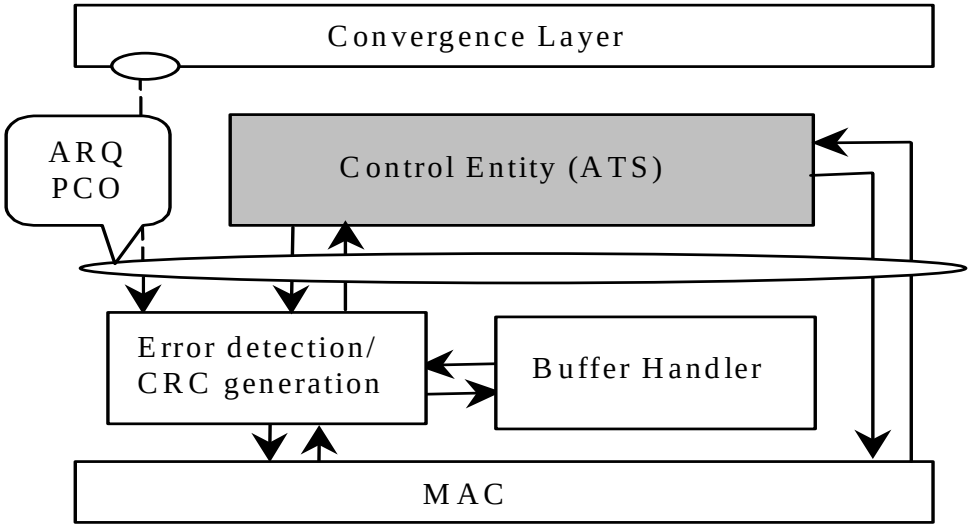

Figure 2: Error control service model for testing

Message Handler: Evaluate or generate CRC; Indicate erroneous PDU; Control read and write to or from buffer handler; Add or Evaluate Sequence Number; Transmit or Receive PDU to or from MAC and Convergence Layers controlled by the Control Entity.

Buffer Handler: Provide management of receive and transmit buffer.

Convergence Layer: Provide traffic generation and absorption capabilities.

Control Entity: Transmission: Handle the transmit window on a basis of sequence number; Evaluate ARQ feedback messages (integrity check); Initiate re-transmission; Release correctly received message from buffer; Handle errors (e.g. Initiation of Reset).

Reception: Handle the receive window including the knowledge of the buffer status; Generate ARQ feedback messages; Trigger the message handler to pass correct in-sequence PDU to the Convergence layer and to release buffer from the buffer handler; Handle errors (e.g. Discarding).

4.3 Test Configurations

4.3.1 Test Configurations for MT

Tree configurations are defined for MT testing.

Figure 3: Normal configuration for MT

The normal configuration is defined and used for functionality that requires only interaction between the tested MT and one AP.