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Technical Specification

Broadband Radio Access Networks (BRAN);
HiperMAN;
Conformance Testing for WiMAX/HiperMAN 1.3.1;
Part 3: Abstract Test Suite (ATS)

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DTS/BRAN-004T008-3

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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
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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Broadband Radio Access Networks (BRAN).

The present document was developed on the basis of the Abstract Test Suite (ATS) specification for HiperMAN systems that was in the advanced stage of development when the work was reoriented to produce joint HiperMAN/WiMAX specifications.

The present document is part 3 of a multi-part deliverable covering Broadband Radio Access Networks (BRAN); HiperMAN; Conformance Testing for WiMAX/HiperMAN 1.3.1, as identified below:

Part 1: "Protocol Implementation Conformance Statement (PICS) pro forma";

Part 2: "Test Suite Structure and Test Purposes (TSS&TP)";

Part 3: "Abstract Test Suite (ATS)".

1 Scope

The present document contains the Abstract Test Suite (ATS) to test BRAN HiperMAN/WiMAX systems for conformance.

The objective of the present document is to provide a basis for conformance tests for BRAN HiperMAN/WiMAX equipment giving a high probability of air interface inter-operability between different manufacturer's BRAN HiperMAN/WiMAX equipment.

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [5] and ISO/IEC 9646-2 [6]) as well as the ETSI rules for conformance testing (ETS 300 406 [4]) 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 SS side ATS.

Annex C provides the Protocol Conformance Test Report (PCTR) Proforma of the SS 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 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.

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.

[1] ETSI TS 102 178 (V1.2.1): "Broadband Radio Access Networks (BRAN); HiperMAN; Data Link Control (DLC) layer".

[2] IEEE 802.16-2004: "IEEE Standard for Local and Metropolitan Area Networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems".

[3] IEEE 802.16e-2005: "IEEE Standard for Local and metropolitan area networks - Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems. Amendment 2: Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands and Corrigendum 1".

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

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

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

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

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

[9] ETSI ES 201 873-1: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

[10] IEEE P802.16-2004/Cor1/D3: "Corrigendum to IEEE Standard for Local and Metropolitan Area Networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646-7 [8], TS 102 178 [1], IEEE 802.16-2004 [2] and IEEE 802.16e-2005 [3] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TS 102 178 [1], ISO/IEC 9646-1 [5], ISO/IEC 9646-6 [7], ISO/IEC 9646-7 [8], IEEE 802.16-2004 [2], IEEE 802.16e-2005 [3] and the following apply:

ATS	Abstract Test Suite
BS	Base Station
BW	BandWidth
CID	Connection IDentifier
CS	Convergence Sublayer
FDD	Frequency Division Duplexing
IUT	Implementation Under Test
OFDM	Orthogonal Frequency Division Multiplexing
OFDMA	Orthogonal Frequency Division Multiple Access
PIXIT	Partial Protocol Implementation Extra Information for Testing
PMP	Point-to-MultiPoint
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
REQ	REQuest
RNG	RaNGing
RSP	ReSPonse
RTG	Receive/Transmit Transition Gap
SS	Subscriber Station
SUT	System Under Test
TC	Test Case
TLV	Type, Length, Value
TP	Test Purposes
TTCN	Test and Test Control Notation
TTG	Transmit/Receive Transition Gap

4 Abstract Test Method (ATM)

This clause describes the ATM used to test the HiperMAN DLC layer at the BS side and at the SS side.

4.1 Test architecture

4.1.1 Test method

The test method chosen is the remote test method with notional upper tester. Remote test method means that the test tool (the test machine + the executable test suite) shall behave as a BS when the IUT is an SS and shall behave as an SS when the IUT is a BS. Notional upper tester means that it is possible to trigger and to force the IUT to execute predefined actions (Example: adding a new service flow with defined parameters, sending data over a known service flow, etc.). This could be done by a specific and proprietary application layer inside the IUT or by other procedures clearly described by the IUT's manufacturer (PIXIT question). As the exchange between the test system and the IUT is the air interface, the PHY layer of the test machine shall be totally conformant with the corresponding PHY layer specification to use the remote test method.

4.1.1.1 What is notional upper tester?

Usually the IUT is not only a plane containing Convergence, MAC and PHY layers, but a real product to be marketed after testing, and therefore the IUT contains also application software to accomplish the purpose of the final product. In that case, the application inside the IUT could be commanded to generate events in direction of the transmission sub layers that shall be used by the testing software as expected IUT's actions. The application layer is the Upper tester as defined in ISO 9646. It is also a notional upper tester, because the test designer cannot determine all of the possible applications that are only market driven.

Considering the explanation of the former paragraph, in terms of source code writing, requesting a notional upper tester action is the combination of the call of an external function and a PIXIT parameter. The external function asks the test laboratory operator to execute the procedure described in the PIXIT parameter. If the action is possible to obtain the external function succeeds, otherwise the test execution becomes inconclusive. The PIXIT parameter is a "how to" question, for which the product manufacturer has to explain the procedure to be used in the IUT to obtain the required action.

Figures 1 to 4 show some examples of possible notional upper tester.

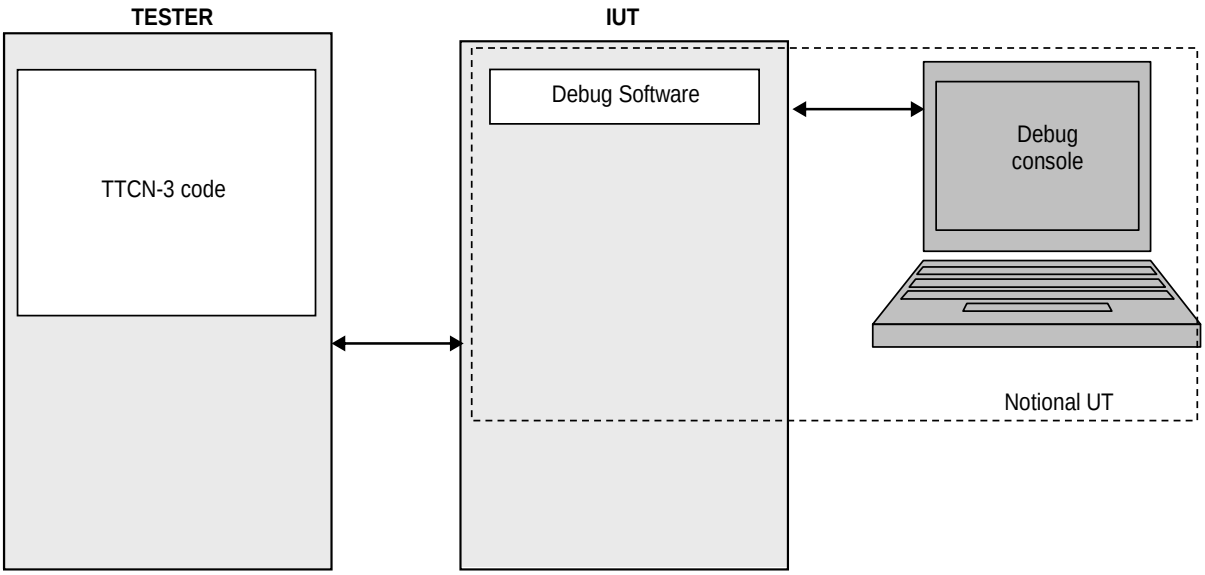

Figure 1: Debug notional upper tester

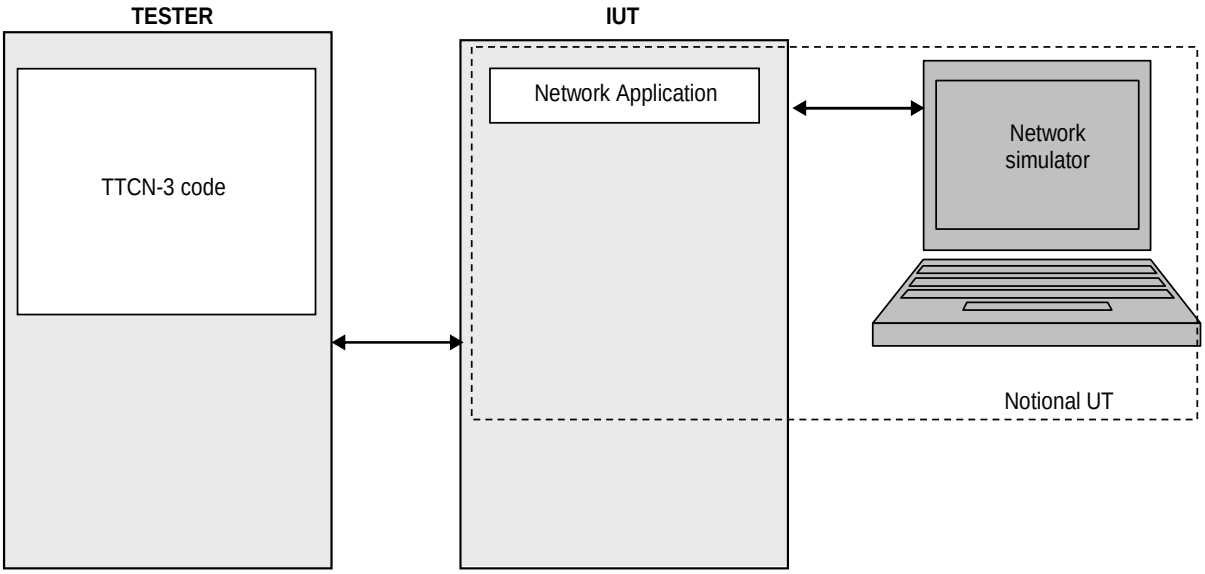

Figure 2: Network driven notional upper tester

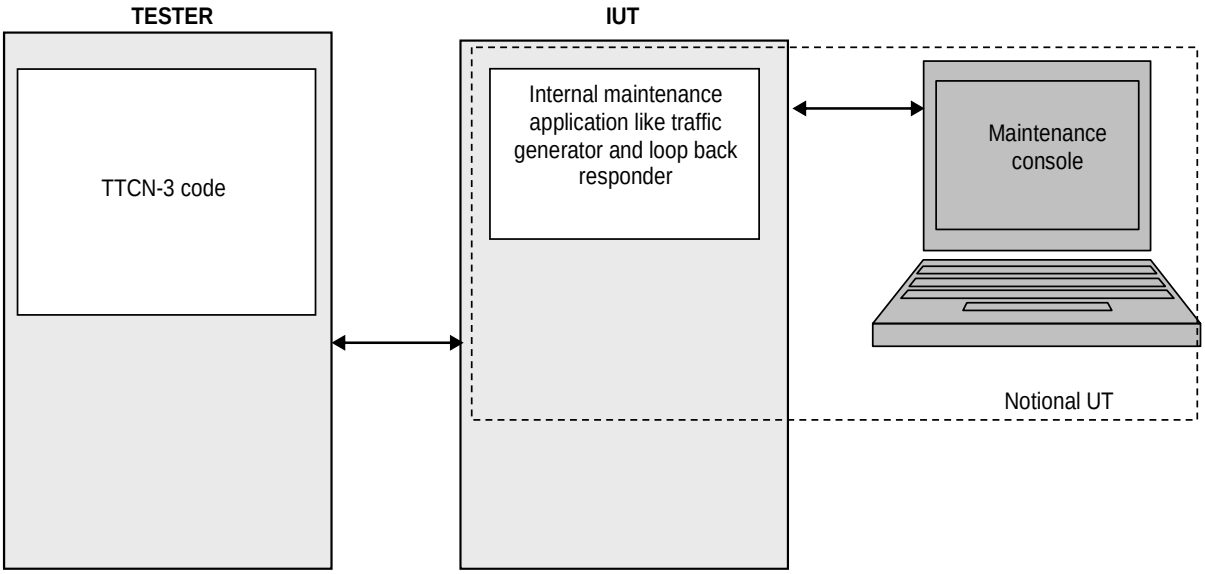

Figure 3: Maintenance application notional upper tester

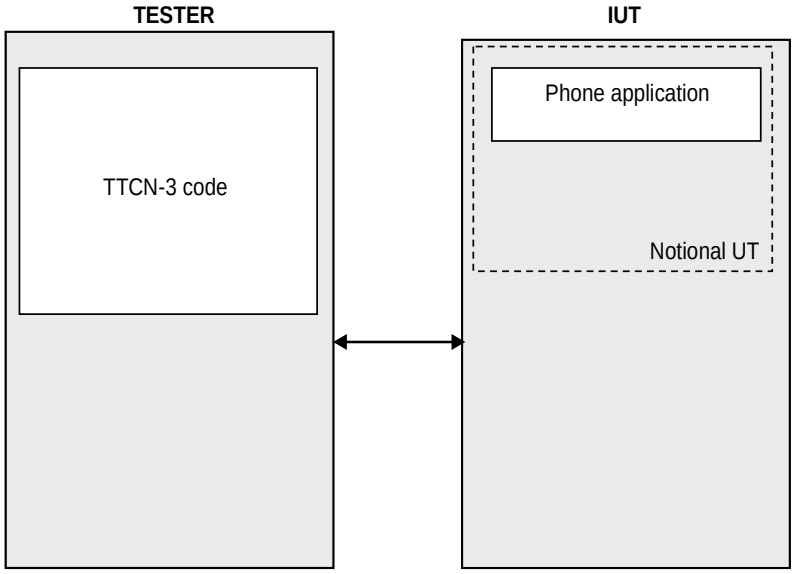

Figure 4: Phone application notional upper tester

4.1.2 Test machine operational parameters

The test machine operational parameters such as frequency, channels, sub channels, power level, etc., could be initialized by static and/or dynamic method.

The static method could be:

1) operational parameters included in the firmware or ROM;
2) operational parameters included in a configuration file executed at power up;
3) other static technique;
4) no default or static operational parameters setting.

The dynamic method could be:

1) before the test cases execution at the beginning of the test campaign and valid for a list of TCs;
2) during the test case execution at the beginning of the test case itself;
3) everywhere during test case execution.

The possibility to acquire and to set all of the operational parameters during the test case execution is a main key to cover all of the requirements to be tested by the TTCN-3 test code.

Considering all of the techniques exposed above, it is possible that the configuration of the operational parameters is done either before the beginning of the TTCN-3 environment or during the initialization of the TTCN-3 environment or during the preamble of a test case. The recommended method is the initialization during preamble of the test case.

Another important problem is the reconfiguration on the fly of some operational parameters. To solve this problem, it is recommended that the test case itself shall be able to start and stop the PHY layer and all of its environments during test case execution.

4.1.3 Test machine configuration

4.1.3.1 Presentation

There are six test machine configurations to allow the complete testing of the required functionalities of the specification.

The test machine configurations are:

1) test machine simulates a BS with OFDM PHY (IUT is a SS with OFDM PHY);

2) test machine simulates a BS with OFDMA PHY (IUT is a SS with OFDMA PHY);

3) test machine simulates a SS with OFDM PHY (IUT is a BS with OFDM PHY);

4) test machine simulates a SS with OFDMA PHY (IUT is a BS with OFDMA PHY);

5) test machine simulates two BS, each of them with OFDM PHY (IUT is a MS with OFDM PHY), This configuration is used for handover and mobility testing;

6) test machine simulates two BS, each of them with OFDMA PHY (IUT is a MS with OFDMA PHY), This configuration is used for handover and mobility testing;

7) test machine simulates one SS and one BS, each of them with OFDM PHY (IUT is a BS with OFDM PHY);

8) test machine simulates one SS and one BS, each of them with OFDMA PHY (IUT is a BS with OFDMA PHY).

NOTE: For a very small number of specification requirements, it is useful to have a configuration with three simulated BS. This increases the number of test machine configuration by two (one for OFDM and one for OFDMA). Considering the effort of hardware and software development and the corresponding costs, implementation of these configurations shall be investigated very carefully, taking into account interoperability testing rather than conformance testing.

The configurations 1, 2, 3 and 4 can be covered by a single testing approach. The configurations 5, 6, 7 and 8 shall be covered by a concurrent testing approach (it is necessary to monitor and synchronize the two simulated BS test code to obtain a consistent behaviour and a consistent test verdict). The use of the distributed testing possibilities of TTCN-3 is recommended for the physical architecture of the test machine for the test configurations 5 and 6.

The number of physical test machines to cover the eight test configurations could be comprised between one and eight depending of the level of flexibility and parameterisation of the hardware design made by the test tool manufacturer. A physical test machine could also be constituted by a number greater than one of real hardware machine (example: intelligent PHY plane connected to one or more PC executing the TTCN-3 code).

For similar reasons the number of test suites could be comprised between 1 and 8 depending of the level of parameterisation, by use of PICS and PIXIT items, used to design the TTCN-3 code. The conditional compilation may be used to have only one source code and many generated test suite. In terms of performance, it is preferable to have static conditional code generation to shorten the length of the test suite and improve the time execution rather than to have dynamic conditional alternatives controlled by PICS or PIXIT items. In terms of readability and maintenance of the test code it is preferable to have a one to one mapping between the test code and the test machine configuration. The use of libraries, packages and other recent technique of source code management are recommended.

4.1.3.2 Test suite TTCN-3 development concept

The possible Test suite TTCN-3 development concepts are shown in figures 5, 6 and 7.

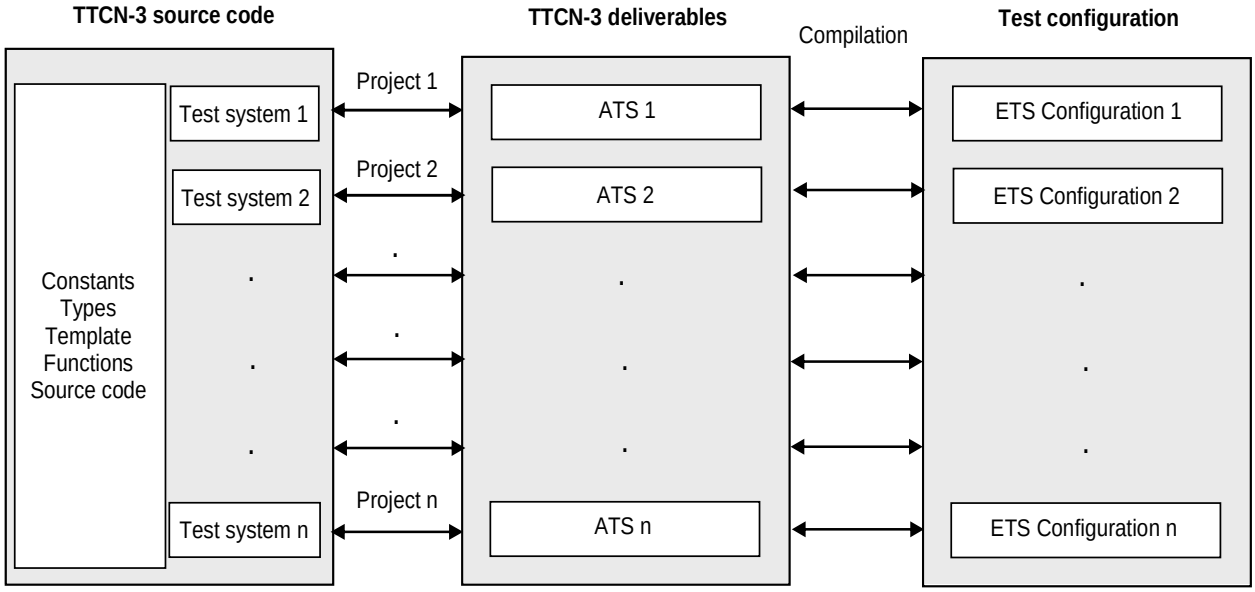

Figure 5: TTCN-3 development concept 1

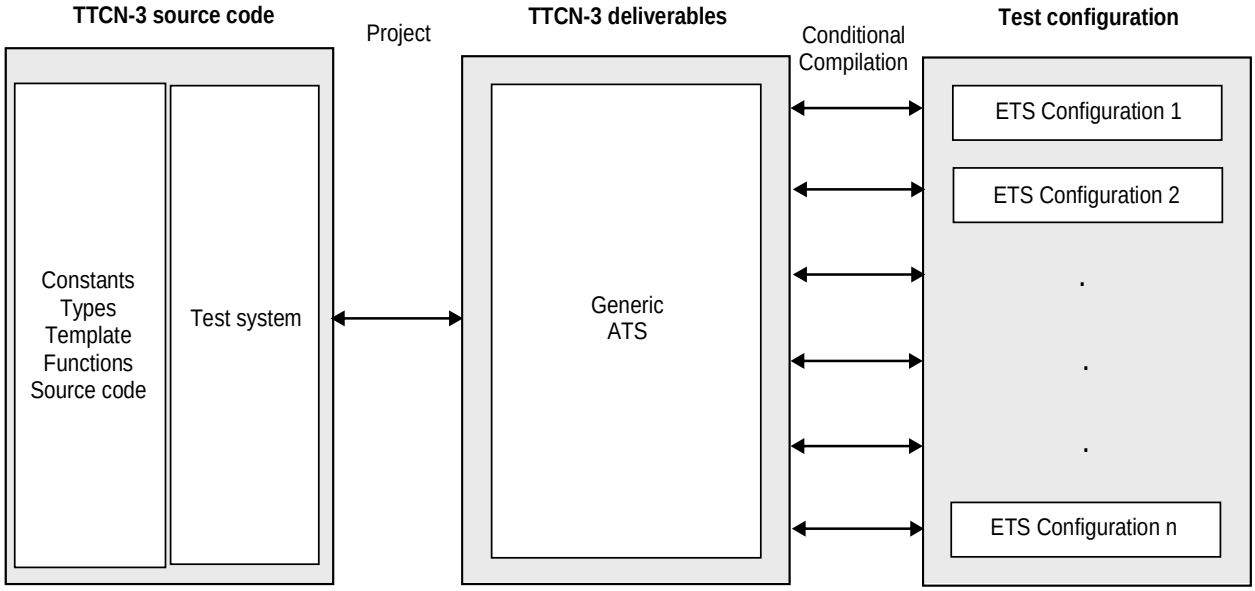

Figure 6: TTCN-3 development concept 2

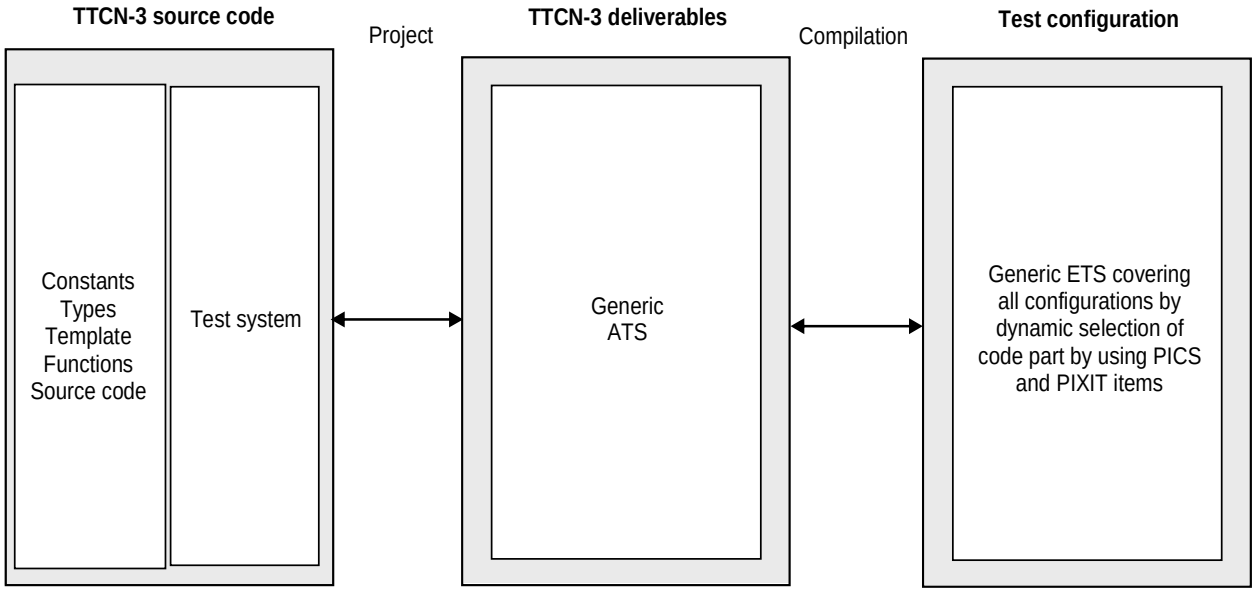

Figure 7: TTCN-3 development concept 3

For all of the three TTCN-3 development concept ,the Test Configuration shall be done dynamically based on PIXIT and PICS parameters.

According to a consensus between the TTCN-3 development team and the Test tool manufacturers, the TTCN-3 development concepts 1 showed above will be used for the real development.

4.1.3.3 Test configurations for SS/MS

There are four normal configurations and two optional configurations for SS/MS testing.

The configuration 1 is defined and used for functionality that requires only interaction between the tested OFDM SS/MS and one OFDM BS. This configuration is shown in figure 8.

Figure 8: Configuration 1 for SS/MS

The configuration 2 is defined and used for functionality that requires only interaction between the tested OFDMA SS/MS and one OFDMA BS. This configuration is shown in figure 9.

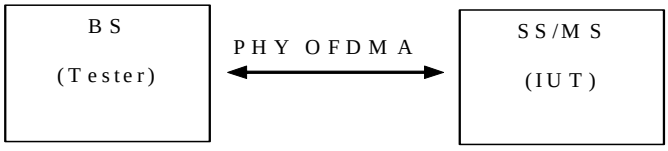

Figure 9: Configuration 2 for SS/MS

The configuration 5 is defined and used when an OFDM SS/MS has to interact with two OFDM BSs. The concurrent TTCN-3 facilities are used in this configuration. This configuration is shown in figure 10.

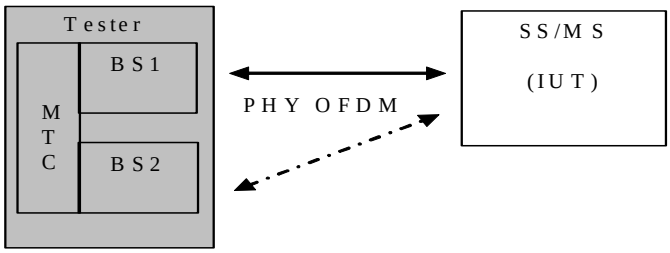

Figure 10: Configuration 5 for SS/MS

The configuration 6 is defined and used when an OFDMA SS/MS has to interact with two OFDMA BSs. The concurrent TTCN-3 facilities are used in this configuration. This configuration is shown in figure 11.

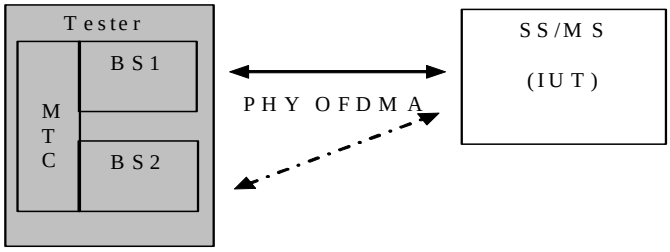

Figure 11: Configuration 6 for SS/MS

The optional configuration Opt1 is defined and used when an OFDM SS/MS has to interact with more than two OFDM BSs. The concurrent TTCN-3 facilities are used in this configuration. This configuration is shown in figure 12.

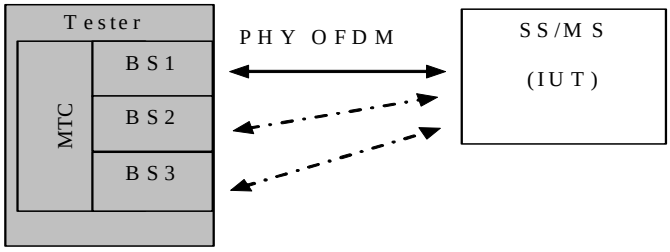

Figure 12: Configuration Opt1 for SS/MS

The optional configuration Opt2 is defined and used when an OFDMA SS/MS has to interact with more than two OFDMA BSs. The concurrent TTCN-3 facilities are used in this configuration. This configuration is shown in figure 13.

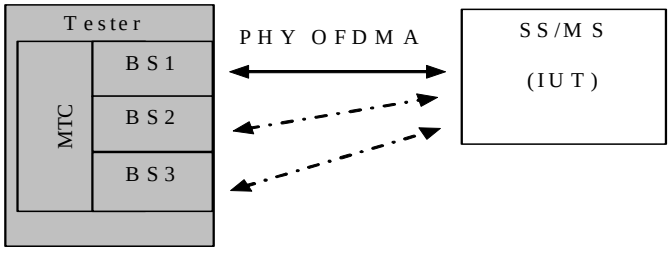

Figure 13: Configuration Opt2 for SS/MS

4.1.3.4 Test configurations for BS

There are two normal configurations and four optional configurations for BS testing.

The configuration 3 is defined and used for functionality that requires only interaction between the tested OFDM BS and one OFDM MS/SS. This configuration is shown in figure 14.

Figure 14: Configuration 3 for BS

The configuration 4 is defined and used for functionality that requires only interaction between the tested OFDMA BS and one OFDMA MS/SS. This configuration is shown in figure 15.

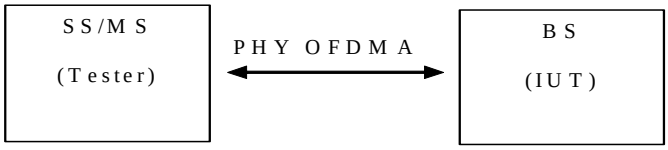

Figure 15: Configuration 4 for BS

The optional configuration Opt3 is defined and used when an OFDM BS has to interact with two OFDM MS/SS. The concurrent TTCN-3 facilities are used in this configuration. This configuration is shown in figure 16.

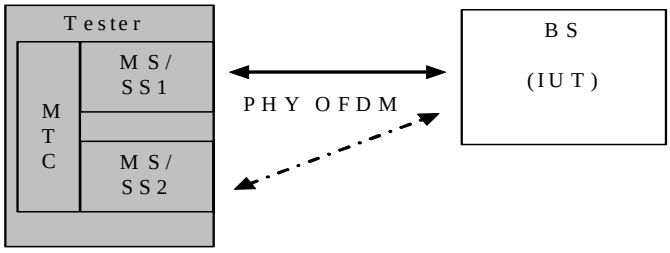

Figure 16: Configuration Opt3 for BS

The optional configuration Opt4 is defined and used when an OFDMA BS has to interact with two OFDMA MS/SS. The concurrent TTCN-3 facilities are used in this configuration. This configuration is shown in figure 17.

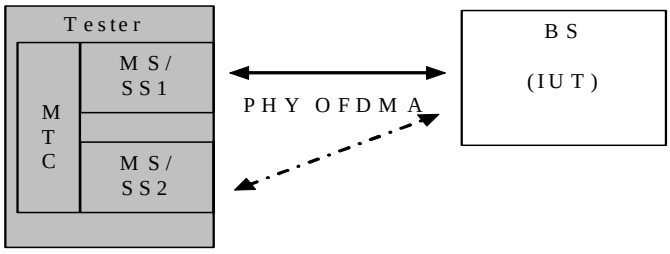

Figure 17: Configuration Opt4 for BS

The optional configuration Opt5 is defined and used when an OFDM BS has to interact with one OFDM BS and one OFDM MS/SS. The concurrent TTCN-3 facilities are used in this configuration. This configuration is shown in figure 18.

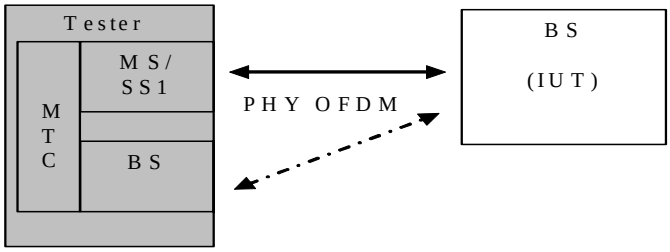

Figure 18: Configuration Opt5 for BS

The optional configuration Opt6 is defined and used when an OFDMA BS has to interact with one OFDMA BS and one OFDMA MS/SS. The concurrent TTCN-3 facilities are used in this configuration. This configuration is shown in figure 19.

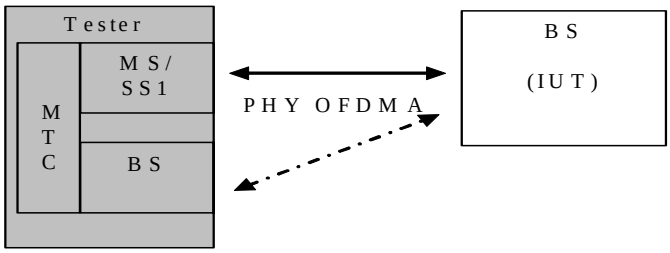

Figure 19: Configuration Opt6 for BS

4.1.4 Re-use of existing test specifications

Due to existing development for IEEE 802.16-2004 [2] and ETSI HiperMAN, it is preferable if not essential to reuse as much of the existing test specifications.

Nevertheless, considering the preceding considerations such as hardware configuration and test configuration, it appears that the existing TTCN code may be only partially re-usable. For TTCN-3 code, the constants, types, templates and internal/external functions could be re-used and extended, but the other parts are certainly not in line with the new hardware and software configuration.

Considering that, there are two possibilities:

1) Starting from scratch with small re-use of existing test specifications.

2) Defining a test architecture that included the architecture defined for IEEE 802.16-2004 [2] and ETSI HiperMAN as near as possible and adding small changes in the actual TTCN-3 code.

According to a consensus between the TTCN-3 development team and the Test tool manufacturers, the second possibility showed above will be used for the real development.

4.1.5 Test architecture

Figures 20 and 21 describe the DLC BS/SS Test Configuration for testing the DLC layer of a product implementing the HiperMAN base standard. More information for these architectures is provided below. Figure 20 is related to single testing. Figure 21 is related to concurrent testing.

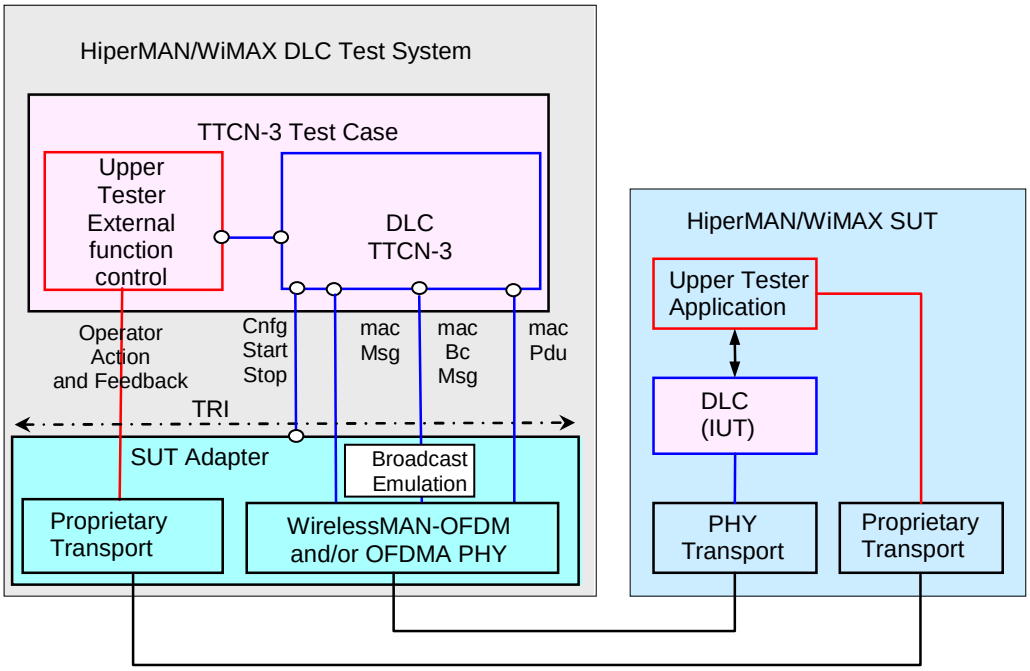

Figure 20: Single DLC BS/SS Test Configuration

DLC TTCN-3 uses macMsg port to send and receive MAC management messages that belong to the Initial Ranging, Basic, Primary and Secondary connection. Final verdicts are set on the receive statements. Additionally to the MAC message received, the real raw data received before decoding by the test adapter are necessary for log interpretation and fields computation (i.e. checks of the HMAC digest for example). Is also important to received the EC bit to know if the received content is encrypted and the EKS key number to know witch of the two key has to be used for decrypting.

DLC TTCN-3 uses macBcMsg port to receive MAC management messages that belong to the Broadcast connection. Final verdicts are set on the return status of the receive functions. In BS mode this port is always mapped and used just to indicate when the Bc message needs to change in each TC and is used in an initial stage to configure the Bc messages. In SS mode this port is always mapped (and a socket is open therefore), and sometimes this port is polled in order to retrieve the broadcast messages sent by the BSUT. As the Bc in the TCs is sent in a periodically way, there must be a primitive generated by the Adaptor that is under the TTCN-3 code to indicate to the Lower MAC that the last Bc message must be sent to the Control PC. It doesn't matter if there is some delay in this transmission, because the Bc is tested when the SS has not initiate the initial ranging procedure.

DLC TTCN-3 uses macPdu port to send and receive MAC PDUs. Final verdicts are set on the receive statements.

The broadcast emulation handles the sending and reception of the broadcast messages.

DLC TTCN-3 controls via external functions the Upper Tester Application. Upper Tester Application allows triggering the IUT. Final verdicts are set on the return status of the external functions.

DLC TTCN-3 uses CnfgStartStop port to configure, to start and to stop the Test Adapter and Test machine by sending request primitives and receiving indication primitives. Final verdicts are set on the return status of the indication primitives. A complete description of the primitives and behaviour of this port will be included in future releases of the present document.

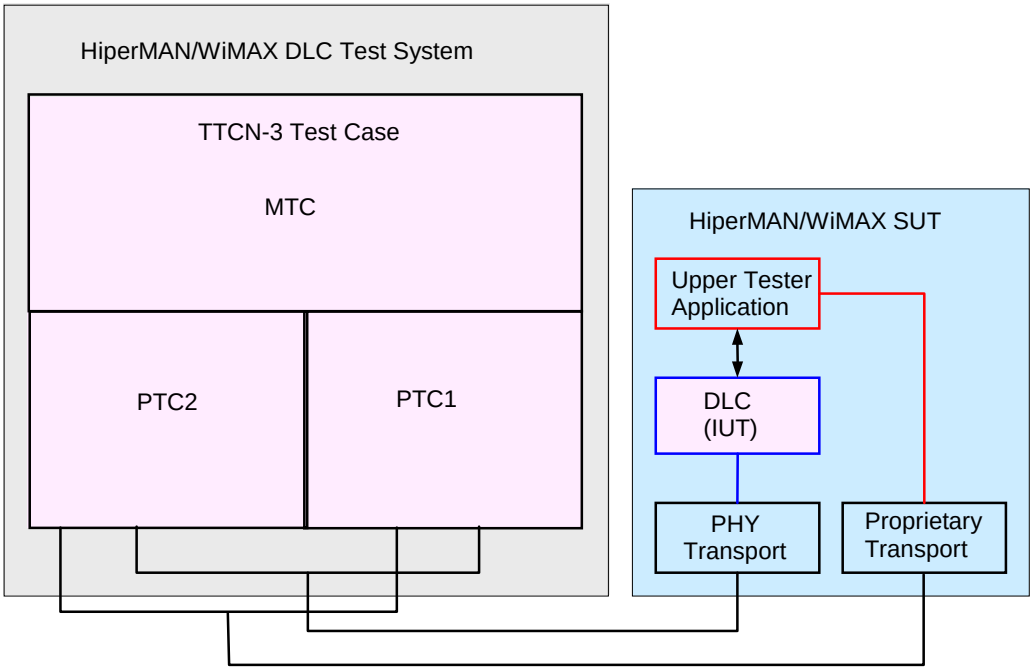

Figure 21: Concurrent DLC BS/SS Test Configuration (logical representation)

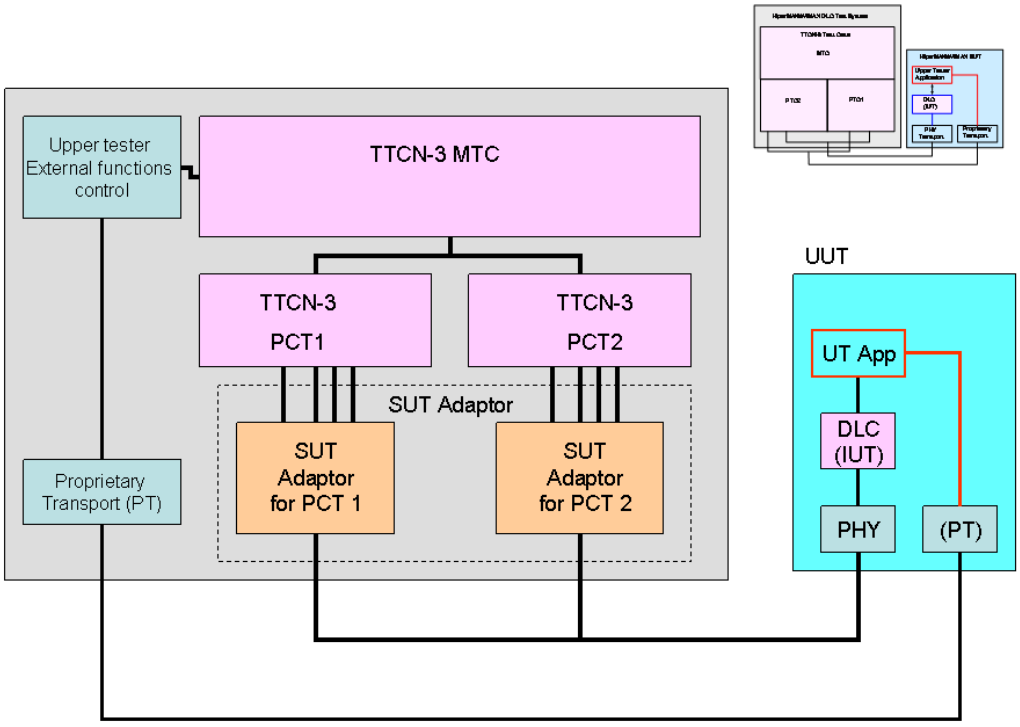

Figure 22: Concurrent DLC BS/SS Test Configuration (physical representation)

The concurrent DLC BS/SS Test Configuration provides 3 test components:

- MTC: Master test component triggers and synchronizes the parallel test components.
- PTC1: Parallel test component 1. Identical to single testing plane to simulate one BS or MS/SS test case part.
- PTC2: Parallel test component 2. Identical to single testing plane to simulate another BS or MS/SS test case part.

NOTE: The number of parallel test components could be extended by adding the corresponding number of single testing plane to perform the required configuration.

All of the parallel test components shall have an identical PHY layer (OFDM or OFDMA).

4.1.6 CnfgStartStop port description

This port is proprietary to the test tool manufacturer and will be described in future releases of the present document.

5 Untestable Test Purposes (TP)

This clause gives a list of TP, which are not implemented in the ATS due to the chosen ATM or other restrictions.

Table 1: Untestable TP

Test Case Name	Reason
void	

6 ATS conventions

The ATS conventions are intended to give a better understanding of the ATS but they also describe the conventions made for the development of the ATS. These conventions shall be considered during any later maintenance or further development of the ATS.

The ATS conventions contain two clauses, the naming conventions and the implementation conventions. The naming conventions describe the structure of the naming of all ATS elements. The implementation conventions describe the functional structure of the ATS.

To define the ATS, the guidelines of the document ETS 300 406 [4] were considered.

6.1 Testing conventions

6.1.1 Testing States

BS Null: The BS is switched on and sends broadcast messages.

SS Null: The SS is switched on and is ready to receive broadcast messages.

6.1.2 HiperMAN default values: Reception and transmission at ATS level

IEEE P802.16-2004 [10] lists many default TLV values. The spec says that devices SHOULD NOT transmit TLVs if the default value applies. However, this is NOT a requirement. Thus, one tested device may not transmit the default TLVs (or a subset of these default TLVs) while another may transmit all TLVs including the defaults. Including all the possible combinations of sent and received default TLVs in an ATS is problematic.

- Therefore, for ATS purposes, all TLVs are assumed to be sent and received at the ATS level.
- The Test Adapter will fill in the missing received TLVs with a TLV containing the default value and pass it up to the ATS.
- The Test Adapter may or may not transmit default TLVs received from the ATS to the IUT. This is a test equipment vendor decision.

6.1.3 Templates

Separate templates are defined for use in sending and receiving operations.

Template definitions should avoid using matching attributes such as "*" or "?" for complete structured values, e.g. record or set of values.

PIXIT parameter values are passed as parameters into templates.

6.1.4 Functions

The WMx ATS differentiates between external functions for which only the signature is specified and functions completely defined in the ATS. The completely defined functions are separated according to their use for SS or BS testing and preamble and postamble functions.

The SS and BS testing functions are grouped in a general configurations functions group and separate groups with functions used for testing different types of functionality.

Each type of function is implemented in a separate module, although there may be multiple modules for each function type. The following general rules apply:

- Functions use the "*runs on"* statement wherever this is possible.
- Each function provides a return value wherever this is possible. The return value used is the enumeration type "FncRetCode" defined in the WMx_Types.ttcn file.

EXAMPLE: WMx_Types.FncRetCode.

- The *stop* statement is used only for controlled test component shutdown.

6.2 Naming conventions

6.2.1 General guidelines

The naming convention is based on the following underlying principles:

- In most cases, identifiers should be prefixed with a short alphabetic string (specified in table 2) indicating the type of TTCN-3 element it represents.
- Suffixes should not be used except in those specific cases identified in table 7.
- Prefixes and suffixes should be separated from the body of the identifier with an underscore ("_"):

EXAMPLE: `c_sixteen, t_wait_max`.

- Only module names, data type names and module parameters should begin with an upper-case letter. All other names (i.e. the part of the identifier following the prefix) should begin with a lower-case letter.
- The start of second and subsequent words in an identifier should be indicated by capitalizing the first character. Underscores should not be used for this purpose.

EXAMPLE: `f_authenticateUser`.

Table 2 specifies the naming guidelines for each element of the TTCN-3 language indicating the recommended prefix, suffixes (if any) and capitalization.

Table 2: TTCN-3 naming convention

Language element	Naming convention	Prefix	Suffix	Example	Notes
Module	Use upper-case initial letter	*none*	*none*	WMx_Templates	
TSS grouping	Use all upper-case letters	*none*	*none*	TP_RT_PS_TR	
Item group within a module	Use lower-case initial letter	*none*	*none*	messageGroup	
Data type	Use upper-case initial letter	*none*	*none*	SetupContents	
List type identifiers	Use upper-case initial letter	none	*none*	DlMapIeList	
Message template	Use lower-case initial letter	m_	none	m_setupInit	
Message template with wildcard or matching expression	Use lower-case initial letters	mw_	none	mw_setupBasic	
Port instance	Use lower-case initial letter	*none*	*none*	signallingPort	
Test component ref	Use lower-case initial letter	*none*	*none*	userTerminal	
Signature	Use lower-case initial letter	s_	*none*	s_callSignature	
External function	Use lower-case initial letter	xf_	*none*	xf_calculateLength()	
Constant	Use lower-case initial letter	c_	*none*	c_maxRetransmission	
Function	Use lower-case initial letter	f_	*none*	f_authentication()	
Altstep	Use lower-case initial letter	a_	*none*	a_receiveSetup()	
Altstep (Default)	Use lower-case initial letter	d_	*none*	d_receiveOtherMessages()	
Variable	Use lower-case initial letter	v_	*none*	v_basicCid	
Variable, global to component	Use lower-case initial letter	g_	*none*	g_ssSimu.basicCid	
Timer	Use lower-case initial letter	t_	_min _max	t_wait t_auth_min	Note 1
Module parameters PICS values PIXIT values	Use all upper case letters	*none*	*none*	PIC_T7PXT_TNOAC	Note 2
External constant	Use lower-case initial letter	xc_	*none*	xc_macId	
Parameterization	Use lower-case initial letter	p_	*none*	p_macId	
Enumerated Value	Use lower-case initial letter	e_	*none*	e_synCpk	

NOTE 1: If a time window is needed, the suffixes "_min" and "_max" should be appended.
NOTE 2: In this case it is acceptable to use underscore as a word delimiter.

6.2.2 Test Case (TC) identifier

Table 3: TC naming convention

TC_<st>_<pg>_<fg>_<sg>_<ini>_<x>_H<nnn>		
<st> = side type	BS	Base Station
	SS	Subscriber Station
<pg> = protocol group	CDM	Channel Descriptors and Maps
	RLC	Radio Link Control
	INI	Registration, IP Connectivity, and Parameter Transfer
	PKM	Privacy and Key Management
	DS	Dynamic Services
	BWA	Bandwidth Allocation and Polling
	RER	Reset and Re-registration
	CCC	Clock Comparison
	MAC	MAC PDU Construction
	PCS	Packet CS
<fg> = function group	MAP	Map and Frame Structure
	CD	Channel Descriptors
	CDC	Channel Descriptor Change
	IRNG	Initial Ranging
	PRNG	Periodic Ranging
	DBPC	Downlink Burst Profile Management
	SBC	Negotiate Basic Capabilities
	REG	Registration
	IPC	IP Connectivity
	AUTH	Authentication/Authorization
	TEK	Encryption Key Transfer
	SAM	Security Association Management
	EKS	Encryption and Key Scheduling
	DSA	Dynamic Service Addition
	DSC	Dynamic Service Change
	DSD	Dynamic Service Deletion
	REQ	Request/Grant
	MCP	Multicast Polling
	PACK	Packing
	FRAG	Fragmentation
	CAT	PDU Concatenation
	CRC	Cyclic Redundancy Check (CRC)
	ARQ	ARQ
	PCU	Packet CS Usage
	CLS	Classification
	CDS	Classifier DSx Signalling
	PHS	Payload Header Suppression
<sg> = subfunction group	INIT	Initialization
	OPN	Operation
	RLV	Relevance
	KU	Key Usage
	ENC	Encryption
	DEC	Decryption
<ini> = initiator of procedure or direction of flow	BsIni	Procedure is initiated by BS
	SsIni	Procedure is initiated by SS
	DL	Downlink
	UL	Uplink
<x> = type of testing	BV	Valid Behaviour Tests
	BI	Invalid Syntax or Behaviour Tests
	BO	Inopportune Behaviour Tests
	TI	Timer and Counter Tests
<nnn> = sequential number	Hnnn	(H000, H001, …)

EXAMPLE: TP identifier: TP/SS/RLC/IRNG/BV-H002
TC identifier: TC_SS_RLC_IRNG_BV_H002.

7 External functions

7.1 List organized by the type of external function

7.1.1 Functions for computation

7.1.1.1 IUT is a BS

Table 4: Computation function for BS

Nbr	Computation
1	xf_getRandom
2	xf_getNonce

7.1.1.2 IUT is a SS

Table 5: Computation function for SS

Nbr	Computation
1	xf_bsGetTek
2	xf_bsGetCbcIv
3	xf_bsGetEncryptionAndLocalKeys
4	xf_getRandom

7.1.1.3 Common Functions

Table 6: Computation function for BS and SS

Nbr	Computation
1	xf_calcLen_phsRulesTLVs
2	xf_calcLen_securityNegotiationTLVs
3	xf_calcDlHmac
4	xf_calcUlHmac
5	xf_calcDlCmac
6	xf_calcUlCmac

7.1.2 Specific TA functions

7.1.2.1 IUT is a BS

Table 7: Specific TA functions for BS

Nbr	Specific TA functions
1	xf_ssSimuRecordReceivedUcdUlMap
2	xf_ssSimuDlfpReceived
3	xf_ssSimuStartInitRng_OFDMA
4	xf_setBcMsgFilter
5	xf_setRangingParams_OFDMA

7.1.2.2 IUT is a SS

Table 8: Specific TA functions for SS

Nbr	Specific TA functions
1	xf_bsSimuStartInitRng_OFDMA
2	xf_getCdmaCodeFromSs
3	xf_getCdmaCodeRNGSucessFromSs
4	xf_getRngCodeAttributes_OFDMA
5	xf_switchToMaxRelevance
6	xf_checkMaxRelevance

7.1.2.3 Common Functions

Table 9: Specific TA functions for BS and SS

Nbr	Specific TA functions
1	xf_getCurrentPower

7.1.3 Functions to configure the Tester

7.1.3.1 IUT is a BS

Table 10: Configuration when IUT is a BS

Nbr	Operator action
1	cf_ssSimuBasicPhyConfig
2	cf_ssSimuInitialRangingConfig
3	cf_ssSimuBandwidthRequestConfig
4	cf_ssSimuRFConfig

7.1.3.2 IUT is a SS

Table 11: Configuration when IUT is a SS

Nbr	Operator action
1	cf_bsSimuBasicPhyConfig
2	cf_bsSimuDlBurstConfig
3	cf_bsSimuUlBurstConfig
4	cf_bsSimuCreateDlNormalZone
5	cf_bsSimuCreateUlNormalZone
6	cf_bsSimuFchConfig
7	cf_bsSimuAssignDlBurst_Map
8	cf_bsSimuAssignDlBurst_Normal
9	cf_bsSimuAssignUlBurst_InitialRanging_HandoffRanging
10	cf_bsSimuAssignUlBurst_PeriodicRanging_BandwidthRequest
11	cf_bsSimuAssignUlBurst_CQICH
12	cf_bsSimuAssignUlBurst_Normal
13	cf_bsSimuRFConfig
14	cf_bsSimuCdmaAllocationConfig

7.2 Description

7.2.1 Functions for computation

7.2.1.1 IUT is a BS

Name	xf_getRandom
Purpose	This function gets a random number of 64 bits.
Parameters	out UInt64 - The calculated 64 bits random number.
Return value	FncRetCode.

Name	xf_getNonce
Purpose	This function gets a random number of 32 bits.
Parameters	out Nonce - The calculated 32 bits random number.
Return value	FncRetCode.

7.2.1.2 IUT is a SS

Name	xf_bsGetTek
Purpose	This function gets an encrypted TEK.
Parameters	in octetstring - The encrypted authentication Key AK. in CryptographicSuite - The cryptographic suite to be used. out Tek - The calculated encrypted TEK.
Return value	FncRetCode

Name	xf_bsGetCbcIv
Purpose	This function gets a CBC IV
Parameters	out CbcIv - The initialization vector for CBC encryption.
Return value	FncRetCode.

Name	xf_bsGetEncryptionAndLocalKeys
Purpose	This function calculates encrypted and unencrypted Auth Key and Tek.
Parameters	in octetstring - The SS public key. out octetstring - The encrypted authentication Key AK. out AuthKey - The unencrypted authentication Key AK.
Return value	FncRetCode.

Name	xf_getRandom
Purpose	This function gets a random number of 64 bits.
Parameters	out UInt64 - The calculated 64 bits random number.
Return value	FncRetCode.

7.2.1.3 Common Functions

Name	xf_calcLen_phsRulesTLVs
Purpose	This function calculates the length of the PhsRulesTLVs.
Parameters	in PhsRulesTLVs - The compound TLV for which the length has to be calculated.
Return value	UInt8 - Calculated length.

Name	xf_calcLen_securityNegotiationTLVs
Purpose	This function calculates the length of the SecurityNegotiationTLVs.
Parameters	in SecurityNegotiationTLVs - The compound TLV for which the length has to be calculated.
Return value	UInt8 - Calculated length.

Name	xf_calcDlHmac
Purpose	This function calculates the HMAC-Digest. Downlink authentication key HMAC_KEY_D shall be used. It can be extracted from the authentication key.
Parameters	in MsgInOut - The message for which the HMAC-Digest has to be calculated. in AuthKey - Authentication key. out HmacDigest - Calculated HMAC-Digest.
Return value	FncRetCode.

Name	xf_calcUlHmac
Purpose	This function calculates the HMAC-Digest. Uplink authentication key HMAC_KEY_U shall be used. It can be extracted from the authentication key.
Parameters	in MsgInOut - The message for which the HMAC-Digest has to be calculated. in AuthKey - Authentication key. out HmacDigest - Calculated HMAC-Digest.
Return value	FncRetCode.

Name	xf_calcDlCmac
Purpose	This function calculates the CMAC Value. Downlink authentication key CMAC_KEY_D shall be used. It can be extracted from the authentication key.
Parameters	in MsgInOut - The message for which the CMAC Value and Pn have to be calculated. in AuthKey - Authentication key. out CmacValue - Calculated CMAC Value. out CmacPn - Calculated CMAC Pn.
Return value	FncRetCode.

Name	xf_calcUlCmac
Purpose	This function calculates the CMAC Value. Uplink authentication key CMAC_KEY_U shall be used. It can be extracted from the authentication key.
Parameters	in MsgInOut - The message for which the CMAC Value and Pn have to be calculated. in AuthKey - Authentication key. out CmacValue - Calculated CMAC Value. out CmacPn - Calculated CMAC Pn.
Return value	FncRetCode.

7.2.2 Specific TA functions

7.2.2.1 IUT is a BS

Name	xf_ssSimuRecordReceivedUcdUlMap
Purpose	Test adapter is started to receive broadcast message. The function does the following actions: 1. Start recording the received UCD and UL-MAP among the broadcast messages. The receiving queue is filtered with only UCD and UL-MAP messages. 2. Count the number of UCD having received. 3. Upon the Test Adapter receiving the sixth UCD, the external function returns successfully with the return code set to e_success.
Parameters	in UInt8 - Number of UCD to be recorded.
Return value	FncRetCode.

Name	xf_ssSimuDlfpReceived
Purpose	Test adapter is started to receive broadcast message. For each frame, the function receives DLFP in FCH. In case of receiving DLFP successfully, the external function returns e_success.
Parameters	None.
Return value	FncRetCode.

Name	xf_ssSimuStartInitRng_OFDMA
Purpose	Test adapter is started to execute initial ranging procedure. HW constructs autonomously the RNG-REQ and includes all elements defined in the template.
Parameters	in template RngReqMessage - The RNG-REQ to be used as guidance for sending.
Return value	FncRetCode.

Name	xf_setBcMsgFilter
Purpose	SsSimu Test adapter filter is configured to enqueue to TTCN only the messages passed on in the parameter field.
Parameters	in BcMacMngtMsgTypeList - The list of broadcast message to be passed to the TTCN code (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	xf_setRangingParams_OFDMA
Purpose	This function passes the Ranging Parameters to the test adapter. Ranging Parameters are retrieved from the received RNG-RSP. The parameters are non-cumulative, i.e. the parameters are used as received from the RNG-RSP. The functionality of wrapping when max/min power is implemented in the test adapter.
Parameters	in PowerLevelAdjust - Value for adjusting the power level. in OffsetFrequencyAdjust - Value for adjusting the frequency offset. in TimingAdjust - Value for adjusting the timing.
Return value	FncRetCode.

7.2.2.2 IUT is a SS

Name	xf_bsSimuStartInitRng_OFDMA
Purpose	Test adapter is started to execute initial ranging procedure. Power, Frequency and Timing Adjust parameters are used for the construction of the first RNG-RSP. Before sending the RNG-RSP, the test adapter shall: 1) construct the RNG-RSP according to its internal process; 2) add Power, Frequency and Timing Adjust parameters to the RNG-RSP; 3) send the RNG-RSP.
Parameters	in PowerLevelAdjust - Value for adjusting the power level. in OffsetFrequencyAdjust - Value for adjusting the frequency offset. in TimingAdjust - Value for adjusting the timing.
Return value	FncRetCode.

Name	xf_getCdmaCodeFromSs
Purpose	This function checks that the IUT transmits a CDMA code with Ranging Code chosen from the Initial Ranging Domain.
Parameters	out RngCode - The ranging code obtained during the initial ranging exchange.
Return value	FncRetCode.

Name	xf_getCdmaCodeRNGSucessFromSs
Purpose	This function gets the CDMA code that was received with correct ranging parameters (power, freq, time) and lead to the sending of RNG-RSP success.
Parameters	out RngCode - The ranging code obtained during the initial ranging exchange.
Return value	FncRetCode.

Name	xf_getRngCodeAttributes_OFDMA
Purpose	This function gets the Ranging Parameters from the test adapter ready to use for the RNG-RSP ,i.e. offset values.
Parameters	out PowerLevelAdjust - Value for adjusting the power level. out OffsetFrequencyAdjust - Value for adjusting the frequency offset. out TimingAdjust - Value for adjusting the timing.
Return value	FncRetCode.

Name	xf_switchToMaxRelevance
Purpose	This function returns success if the test adapter has been configured to switch to Maximum Relevance.
Parameters	None.
Return value	FncRetCode.

Name	xf_checkMaxRelevance
Purpose	This function compares stored UL-MAP and RNG-REQ frame numbers for max relevance.
Parameters	None.
Return value	FncRetCode.

7.1.2.3 Common Functions

Name	xf_getCurrentPower
Purpose	This function gets the current power from SIMU.
Parameters	out PowerLevel - The current power level used for transmission.
Return value	FncRetCode.

7.2.3 Functions to configure the Tester

7.2.3.1 IUT is a BS

Name	cf_ssSimuBasicPhyConfig
Purpose	Set up the basic PHY configuration when the hardware platform is acting as an MSE
Parameters	in SsSimuBasicPhyConfig - The basic PHY configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_ssSimuInitialRangingConfig
Purpose	Set up the CDMA code to be used for Initial Ranging when the hardware platform is acting as an MSE.
Parameters	in SsSimuInitialRangingConfig - The CDMA code to be used for Initial Ranging configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_ssSimuBandwidthRequestConfig
Purpose	Set up the CDMA code to be used for Bandwidth Request when the hardware platform is acting as an MSE.
Parameters	in SsSimuInitialRangingConfig - The CDMA code to be used for Bandwidth Request configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_ssSimuRFConfig
Purpose	Configure the radio card when the hardware platform is acting as an MSE.
Parameters	in SsSimuRFConfig - The radio card configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

7.2.3.2 IUT is a SS

Name	cf_bsSimuBasicPhyConfig
Purpose	Set up the basic PHY configuration when the hardware platform is acting as a BSE.
Parameters	in BsSimuBasicPhyConfig - The Basic PHY configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuDlBurstConfig
Purpose	Configure the DL Burst Profiles when the hardware platform is acting as a BSE.
Parameters	in BsSimuDlBurstConfig - The DL burst configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuUlBurstConfig
Purpose	Configure the UL Burst Profiles when the hardware platform is acting as a BSE.
Parameters	in BsSimuUlBurstConfig - The UL burst configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuCreateDlNormalZone
Purpose	Create a new Normal Zone in the DL sub frame when the hardware platform is acting as a BSE.
Parameters	in BsSimuCreateDlNormalZone - The Normal Zone in the DL sub frame configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuCreateUlNormalZone
Purpose	Create a new Normal Zone in the UL sub frame when the hardware platform is acting as a BSE.
Parameters	in BsSimuCreateUlNormalZone - The Normal Zone in the UL sub frame configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuFchConfig
Purpose	Configure the FCH content when the hardware platform is acting as a BSE.
Parameters	in BsSimuFchConfig - The FCH content configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuAssignDlBurst_Map
Purpose	Create a MAP burst in the DL sub frame when the hardware platform is acting as a BSE.
Parameters	in BsSimuAssignDlBurst_Map - The DL Burst Map configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuAssignDlBurst_Normal
Purpose	Create a normal burst in the DL sub frame when the hardware platform is acting as a BSE.
Parameters	in BsSimuAssignDlBurst_Normal - The normal DL Burst configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuAssignUlBurst_InitialRanging_HandoffRanging
Purpose	Create a burst for Initial Ranging and Handoff Ranging in the UL sub frame when the hardware platform is acting as a BSE.
Parameters	in BsSimuAssignUlBurst_InitialRanging_HandoffRanging - The Initial Ranging and Handoff Ranging UL configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuAssignUlBurst_PeriodicRanging_BandwidthRequest
Purpose	Create a burst for Periodic Ranging and Bandwidth Request in the UL sub frame when the hardware platform is acting as a BSE.
Parameters	in BsSimuAssignUlBurst_PeriodicRanging_BandwidthRequest - The Periodic Ranging and Bandwidth Request UL configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuAssignUlBurst_CQICH
Purpose	Create a burst for CQICH in the UL sub frame when the hardware platform is acting as a BSE.
Parameters	in BsSimuAssignUlBurst_CQICH - The CQICH UL configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuAssignUlBurst_Normal
Purpose	Create a normal burst in the UL sub frame when the hardware platform is acting as a BSE.
Parameters	in BsSimuAssignUlBurst_Normal - The normal UL burst configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuRFConfig
Purpose	Configure the radio card when the hardware platform is acting as a BSE.
Parameters	in BsSimuRFConfig - The radio card configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Name	cf_bsSimuCdmaAllocationConfig
Purpose	Configure the CDMA Allocation IE for UIUC 14 when the hardware platform is acting as a BSE.
Parameters	in BsSimuCdmaAllocationConfig - The CDMA Allocation IE for UIUC 14 configuration (See corresponding PIXIT parameter for more information).
Return value	FncRetCode.

Annex A (normative): WiMAX/HiperMAN 1.3.1 Abstract Test Suite (ATS)

This ATS has been produced using the Testing and Test Control Notation (TTCN-3) according to ES 201 873-1 [9].

A.1 The TTCN-3 Module

The TTCN-3 code corresponding to the ATS is contained in an archive named ts_10254503v010101p0.zip which accompanies the present document.

Annex B (normative): WiMAX/HiperMAN 1.3.1 Partial PIXIT proforma for IUT BS

The PIXIT Proforma is based on ISO/IEC 9646-6 [7]. Any needed additional information can be found in this international standard document.

B.1 Identification summary

Table B.1

PIXIT Number:	
Test Laboratory Name:	
Date of Issue:	
Issued to:	

B.2 ATS summary

Table B.2

Protocol Specification:	
Protocol to be tested:	
ATS Specification:	DTS/BRAN-004T008-3
Abstract Test Method:	DTS/BRAN-004T008-3 clause 4

B.3 Test laboratory

Table B.3

Test Laboratory Identification:	
Test Laboratory Manager:	
Means of Testing:	
SAP Address:	

B.4 Client identification

Table B.4

Client Identification:	
Client Test manager:	
Test Facilities required:	

B.5 SUT

Table B.5

Name:	
Version:	
SCS Number:	
Machine configuration:	
Operating System Identification:	
IUT Identification:	
PICS Reference for IUT:	
Limitations of the SUT:	
Environmental Conditions:	

B.6 Protocol layer information

B.6.1 Protocol identification

Table B.6

Name:	
Version:	
PICS References:	

B.6.2 IUT configuration

Tables in this clause need to be filled by the IUT Manufacturer to specify how the IUT needs to be configured with IUT specific values or describe IUT specific procedures required for complete testing of the IUT.

Table B.7

Parameter name	Parameter meaning	Procedure/Value

B.6.3 Tester configuration

Tables in this clause need to be filled by the Test tool Manufacturer to specify how the tester needs to be configured for the use in the test campaign. If no values are provided in the rightmost column, the default values will be used.
The Test laboratory may choose to use values that are different than the default values according to the test campaign needs.

Table B.8

Parameter name	Parameter meaning	Default	Value for this test campaign
Set up the basic PHY configuration when the hardware platform is acting as an BSE PXT_BSSIMU_BASIC_PHY_CONFIG	Bandwidth in KHz	10 000 (10 MHz)	
	Duplexing mode	0 (TDD)	
	FFT point size	1 024	
	Cyclic Prefix (CP)	8 (1/8)	
	Frame duration in microseconds	5 000 (5 ms)	
	Physical slots (PS) for TTG	296	
	Physical slots (PS) for RTG	168	
	Number of CDMA codes for Initial Ranging	4	
	Number of CDMA codes for Periodic Ranging	4	
	Number of CDMA codes for Bandwidth Request	4	
	Number of CDMA codes for Handover Ranging	0	
	Start number of the available CDMA ranging codes	0	
	Segment ID	0	
	Cell ID	1	
	Preamble Index	1	
Create a new Normal Zone in the DL subframe PXT_BSSIMU_CREATE_DL_NORMAL_ZONE	Zone number, should be unique within the DL subframe, starting from 0	0	
	Start of zone, offset in symbols from the start of the DL subframe	1	
	End of zone, offset in symbols from the start of the DL subframe	28	
	Permutation type, must be set to 0 = PUSC	0	
	Use all subchannels, 1=use all subchannels 0=otherwise	0	
	Permutation base, used in DL subcarrier permutation (range 0 to 31)	1	
	PRBS id, used in PUSC zones where Use All Subchannels is set to 1 (range 0 to 2)	0	

Parameter name	Parameter meaning	Default	Value for this test campaign
Create a new Normal Zone in the UL subframe PXT_BSSIMU_CREATE_UL_NORMAL_ZONE	Zone number, should be unique within the uL subframe, starting from 0	0	
	Start of zone, offset in symbols from the start of the UL subframe	0	
	End of zone, offset in symbols from the start of the UL subframe	17	
	Permutation type, must be set to 0 = PUSC	0	
	Use all subchannels, 1=use all subchannels 0=otherwise	0	
	Permutation base, used in UL subcarrier permutation (range 0 to 128)	64	
Configure the DL Burst Profiles PXT_BSSIMU_DL_BURST_CONFIG	Burst Profile Number for DIUC 0, 0 = QPSK (CC) 1/2	0	
	Burst Profile Number for DIUC 1, 1 = QPSK (CC) 3/4	1	
	Burst Profile Number for DIUC 2, 2 = 16-QAM (CC) 1/2	2	
	Burst Profile Number for DIUC 3, 3 = 16-QAM (CC) 3/4	3	
	Burst Profile Number for DIUC 4, 4 = 64-QAM (CC) 1/2	4	
	Burst Profile Number for DIUC 5, 255 = unused	255 (unused)	
	Burst Profile Number for DIUC 6, 6 = 64-QAM (CC) 3/4	6	
	Burst Profile Number for DIUC 7, 255 = unused	255 (unused)	
	Burst Profile Number for DIUC 8, 255 = unused	255 (unused)	
	Burst Profile Number for DIUC 9, 255 = unused	255 (unused)	
	Burst Profile Number for DIUC 10, 255 = unused	255 (unused)	

Parameter name	Parameter meaning	Default	Value for this test campaign
	Burst Profile Number for DIUC 11, 255 = unused	255 (unused)	
	Burst Profile Number for DIUC 12, 255 = unused	255 (unused)	
Configure the UL Burst Profiles PXT_BSSIMU_UL_BURST_CONFIG	Burst Profile Number for UIUC 1, 0 = QPSK (CC) 1/2	0	
	Burst Profile Number for UIUC 2, 1 = QPSK (CC) 3/4	1	
	Burst Profile Number for UIUC 3, 2 = 16-QAM (CC) 1/2, 255 = unused	2	
	Burst Profile Number for UIUC 4, 3 = 16-QAM (CC) 3/4	3	
	Burst Profile Number for UIUC 5, 255 = unused	255 (unused)	
	Burst Profile Number for UIUC 6, 6 = 64-QAM(CC) 3/4	6	
	Burst Profile Number for UIUC 7, 255 = unused	255 (unused)	
	Burst Profile Number for UIUC 8, 255 = unused	255 (unused)	
	Burst Profile Number for UIUC 9, 255 = unused	255 (unused)	
	Burst Profile Number for UIUC 10, 255 = unused	255 (unused)	

Parameter name	Parameter meaning	Default	Value for this test campaign
Create a burst for FCH in the DL subframe PXT_BSSIMU_ASSIGN_DL_BURST_FCH	Number of the Zone in which this Burst should be created	0	
	1=use following CID field, 0=ignore following CID field	0	
	CID associated with this burst	0	
	DIUC associated with this burst (range 0 to 12)	0	
	Burst number, should be unique within the zone starting from 0	0	
	Symbol offset from the start of the DL subframe	1	
	Subchannel offset	0	
	Repetition coding, 0=none 1=repetition coding of 2 2=repetition coding of 4 3=repetition coding of 6	2	
	Number of symbols for the burst	2	
	Number of subchannels for the burst	4	
Create a burst for DL-MAP in the DL subframe PXT_BSSIMU_ASSIGN_DL_BURST_DLMAP	Number of the Zone in which this Burst should be created	0	
	DIUC associated with this burst (range 0 to 12)	0	
	Burst number, should be unique within the zone starting from 0	1	
	Symbol offset from the start of the DL subframe	1	
	Subchannel offset	4	
	Repetition coding, 0=none 1=repetition coding of 2 2=repetition coding of 4 3=repetition coding of 6	0	
	Number of slots for the MAP burst	25	

Parameter name	Parameter meaning	Default	Value for this test campaign
Create a burst for UL-MAP in the DL subframe PXT_BSSIMU_ASSIGN_DL_BURST_ULMAP	Number of the Zone in which this Burst should be created	0	
	1=use following CID field, 0=ignore following CID field	0	
	CID associated with this burst	0	
	DIUC associated with this burst (range 0 to 12)	0	
	Burst number, should be unique within the zone starting from 0	2	
	Symbol offset from the start of the DL subframe	5	
	Subchannel offset	0	
	Repetition coding, 0=none 1=repetition coding of 2 2=repetition coding of 4 3=repetition coding of 6	0	
	Number of symbols for the burst	2	
	Number of subchannels for the burst	30	
Create a burst for DCD/UCD in the DL subframe PXT_BSSIMU_ASSIGN_DL_BURST_DCDUCD	Number of the Zone in which this Burst should be created	0	
	1=use following CID field, 0=ignore following CID field	0	
	CID associated with this burst	0	
	DIUC associated with this burst (range 0 to 12)	0	
	Burst number, should be unique within the zone starting from 0	3	
	Symbol offset from the start of the DL subframe	7	
	Subchannel offset	0	
	Repetition coding, 0=none 1=repetition coding of 2 2=repetition coding of 4 3=repetition coding of 6	0	
	Number of symbols for the burst	22	

Parameter name	Parameter meaning	Default	Value for this test campaign
	Number of subchannels for the burst	7	
Create a burst for Signalling in the DL subframe PXT_BSSIMU_ASSIGN_DL_BURST_BASICCID	Number of the Zone in which this Burst should be created	0	
	1=use following CID field, 0=ignore following CID field	0	
	CID associated with this burst	0	
	DIUC associated with this burst (range 0 to 12)	6	
	Burst number, should be unique within the zone starting from 0	4	
	Symbol offset from the start of the DL subframe	7	
	Subchannel offset	7	
	Repetition coding, 0=none 1=repetition coding of 2 2=repetition coding of 4 3=repetition coding of 6	0	
	Number of symbols for the burst	22	
	Number of subchannels for the burst	8	
Create a burst for Initial Ranging and Handoff Ranging in the UL subframe PXT_BSSIMU_ASSIGN_UL_BURST_INITRNG_HANDOFFRNG	Number of the Zone in which this Burst should be created	0	
	Burst number, should be unique within the zone starting from 0	0	
	Symbol offset from the start of the DL subframe	0	
	Subchannel offset	0	
	Number of symbols for the burst	2	
	Number of subchannels for the burst	6	
	Ranging method, 0=ranging over 2 symbols 1=ranging over 4 symbols	0	

Parameter name	Parameter meaning	Default	Value for this test campaign
Create a burst for Periodic Ranging and Bandwidth Request in the UL subframe PXT_BSSIMU_ASSIGN_UL_BURST_PRNG_BWR	Number of the Zone in which this Burst should be created	0	
	Burst number, should be unique within the zone starting from 0	1	
	Symbol offset from the start of the DL subframe	2	
	Subchannel offset	0	
	Number of symbols for the burst	1	
	Number of subchannels for the burst	6	
	Ranging method, 0=ranging over 2 symbols 1=ranging over 4 symbols	0	
Create a burst for CQICH in the UL subframe PXT_BSSIMU_ASSIGN_UL_BURST_CQICH	Number of the Zone in which this Burst should be created	0	
	Burst number, should be unique within the zone starting from 0	2	
	Symbol offset from the start of the DL subframe	0	
	Subchannel offset	6	
	Number of symbols for the burst	3	
	Number of subchannels for the burst	29	

Parameter name	Parameter meaning	Default	Value for this test campaign
Create a normal burst for Signalling in the UL subframe PXT_BSSIMU_ASSIGN_UL_BURST_BASICCID	Number of the Zone in which this Burst should be created	0	
	1=use following CID field, 0=ignore following CID field	0	
	CID associated with this burst	0	
	UIUC associated with this burst (range 1 to 10)	6	
	Burst number, should be unique within the zone starting from 0	3	
	Symbol offset from the start of the UL subframe	3	
	Subchannel offset	0	
	Repetition coding, 0=none 1=repetition coding of 2 2=repetition coding of 4 3=repetition coding of 6	9	
	Number of slots for the burst	52	
Configure the FCH content PXT_BSSIMU_FCH_CONFIG	Used subchannels bitmap, must be set to 63 (0x3f) = all subchannel groups are used	63	
	Repetition coding used on DL-MAP, 0=none 1=repetition coding of 2 2=repetition coding of 4 3=repetition coding of 6	0	
	Encoding used on DL-MAP, 0=CC 2=CTC	0	
Configure the RF (radio card) PXT_BSSIMU_RF_CONFIG	Center Frequency in kHz	2 550 000	
	520 // Output power level in units of -10 * dBm	520 (52 dBm)	
Configure the CDMA Allocation IE for UIUC 14 PXT_BSSIMU_CDMA_ALLOCATION_CONFIG	UIUC for transmission (range 1 to 10)	1	

B.6.4 Test campaign configuration

Tables in this clause need to be filled by the Test Laboratory to specify how the tester parameters need to be configured for a particular test campaign or to match the corresponding parameters of the IUT.

B.6.4.1 Tester parameterisation

Table B.9

Parameter name	Parameter meaning	Value for the IUT Or IUT PICS reference
PXT_TIMER_PRECISION	Precision of timers in percentage (default is 5 percent).	5,0
PXT_TAC	Guard timer to control a reaction.	2,0
PXT_TNOAC	Guard timer to control a non-reaction.	5,0
PXT_TWAIT	Guard timer to wait for a specific event.	60,0
PXT_POWER_LEVEL_ADJUST	Initial power level adjustment.	0
PXT_TIMING_ADJUST	Initial timing adjustment.	0
PXT_OFFSET_FREQ_ADJUST	Initial frequency offset adjustment	0
PXT_CRYPTO_SUITE_TO_TEST	Encryption to be tested.	ccm128Aes_ccm_128EcbAes
PXT_SA_TYPE_SPEC_TO_TEST	SA type to be tested.	e_primary
PXT_SAID_TO_TEST	SAID number to be tested.	27
PXT_UNAUTHORIZED_SAID	Unauthorized Security Association Id.	5
PXT_TEK_LIFETIME	TEK lifetime for testing.	30,0
PXT_FRAME_NUMBER	Frame number in which the old PMK and all its associated AKs should be discarded.	'001122'O

B.6.4.2 Tester campaign specific values

Table B.10 Parameters for DCD message

Parameter name	Parameter meaning	Default	Value for this test campaign
PXT_MAX_NR_OF_DCD_RCV	Number of times that DCD shall be received in order to assure periodic reception	3	

Table B.11 Parameters for RNG-RSP message

Parameter name	Parameter meaning	Default	Value for this test campaign
PXT_BASIC_CID	Basic CID to be sent.	10	
PXT_PRIM_CID	Primary CID to be sent.	20	
PXT_SEC_CID	Secondary CID to be sent.	30	

Table B.12 Parameters for UCD message

Parameter name	Parameter meaning	Default	Value for this test campaign
PXT_MAX_NR_OF_UCD_RCV	Number of times that UCD shall be received in order to assure periodic reception	3	
PXT_UCD_MAX_INTERVAL	Maximum interval value for receiving an UCD message	10,0	

Annex C (normative): WiMAX/HiperMAN 1.3.1 Partial PIXIT proforma for IUT MS

The PIXIT Proforma is based on ISO/IEC 9646-6 [7]. Any needed additional information can be found in this international standard document.

C.1 Identification summary

Table C.1

PIXIT Number:	
Test Laboratory Name:	
Date of Issue:	
Issued to:	

C.2 ATS summary

Table C.2

Protocol Specification:	
Protocol to be tested:	
ATS Specification:	DTS/BRAN-004T008-3
Abstract Test Method:	DTS/BRAN-004T008-3 clause 4

C.3 Test laboratory

Table C.3

Test Laboratory Identification:	
Test Laboratory Manager:	
Means of Testing:	
SAP Address:	

C.4 Client identification

Table C.4

Client Identification:	
Client Test manager:	
Test Facilities required:	

C.5 SUT

Table C.5

Name:	
Version:	
SCS Number:	
Machine configuration:	
Operating System Identification:	
IUT Identification:	
PICS Reference for IUT:	
Limitations of the SUT:	
Environmental Conditions:	

C.6 Protocol layer information

C.6.1 Protocol identification

Table C.6

Name:	
Version:	
PICS References:	

C.6.2 IUT configuration

Tables in this clause need to be filled by the IUT Manufacturer to specify how the IUT needs to be configured with IUT specific values or describe IUT specific procedures required for complete testing of the IUT.

Table C.7

Parameter name	Parameter meaning	Procedure/Value

C.6.3 Tester configuration

Tables in this clause need to be filled by the Test tool Manufacturer to specify how the tester needs to be configured for the use in the test campaign. If no values are provided in the rightmost column, the default values will be used.
The Test laboratory may choose to use values that are different than the default values according to the test campaign needs.

Table C.8

Parameter name	Parameter meaning	Default	Value for this test campaign
Set up the basic PHY configuration when the hardware platform is acting as an MSE PXT_SSSIMU_BASIC_PHY_CONFIG	Bandwidth in KHz	10 000 (10 MHz)	
	Duplexing mode	0 (TDD)	
	FFT point size	1 024	
	Cyclic Prefix (CP)	8 (1/8)	
	Frame duration in microseconds	5 000 (5 ms)	
Configure the RF (radio card) PXT_SSSIMU_RF_CONFIG	Output power level	20 (2 dBm)	
Set up the CDMA code to be used for Initial ranging PXT_SSSIMU_INITRNG_CONFIG	Burst number for sending CDMA code	0	
	Zone number for sending CDMA code	0	
	CDMA code	0	
	OFDMA symbol	0	
	Subchannel	0	
	Transmit power, must be set to 0	0	
	Ranging method, 0=ranging over 2 symbols, 1=ranging over 4 symbols, 255=specified by BS	255	
Set up the CDMA code to be used for Bandwidth Request PXT_SSSIMU_BWR_CONFIG	Burst number for sending CDMA code	1	
	Zone number for sending CDMA code	0	
	CDMA code	0	
	OFDMA symbol	0	
	Subchannel	0	
	Transmit power, must be set to 0	0	
	Ranging method, 0=ranging over 2 symbols, 1=ranging over 4 symbols, 255=specified by BS	255	

C.6.4 Test campaign configuration

Tables in this clause need to be filled by the Test Laboratory to specify how the tester parameters need to be configured for a particular test campaign or to match the corresponding parameters of the IUT.

C.6.4.1 Tester parameterisation

Table C.9

Parameter name	Parameter meaning	Value for the IUT Or IUT PICS reference
PXT_TIMER_PRECISION	Precision of timers in percentage (default is 5 percent).	5,0
PXT_TAC	Guard timer to control a reaction.	2,0
PXT_TNOAC	Guard timer to control a non-reaction.	5,0
PXT_TWAIT	Guard timer to wait for a specific event.	60,0
PXT_POWER_LEVEL_ADJUST	Initial power level adjustment.	0
PXT_TIMING_ADJUST	Initial timing adjustment.	0
PXT_OFFSET_FREQ_ADJUST	Initial frequency offset adjustment.	0
PXT_CRYPTO_SUITE_TO_TEST	Encryption to be tested.	ccm128Aes_ccm_128EcbAes
PXT_SA_TYPE_SPEC_TO_TEST	SA type to be tested.	e_primary
PXT_SAID_TO_TEST	SAID number to be tested.	27
PXT_UNAUTHORIZED_SAID	Unauthorized Security Association Id.	5
PXT_TREAUTH_WAIT_TIMEOUT	ReAuth Wait Timeout for testing.	4,0
PXT_TAUTH_REJECT_WAIT_TIMEOUT	Reject Wait Timeout for testing.	4,0
PXT_TAUTH_GRACE_TIME	Grace time of Auth Key in seconds for testing.	10,0
PXT_TAUTH_WAIT_TIMEOUT	Auth Wait Timeout for testing.	4,0
PXT_TTEK_GRACE_TIME	Grace time of Auth Key in seconds for testing.	5,0
PXT_TOPN_WAIT_TIMEOUT	Auth Wait Timeout for testing.	4,0
PXT_TREKEY_WAIT_TIMEOUT	Rekey Wait Timeout for testing.	4,0
PXT_TEK_LIFETIME	TEK lifetime for testing.	30,0
PXT_FRAME_NUMBER	Frame number in which the old PMK and all its associated AKs should be discarded.	'001122'O

C.6.4.2 Tester campaign specific values

Table C.10: Parameters for RNG-REQ message

Parameter name	Parameter meaning	Default	Value for this test campaign
PXT_MAC_ADDRESS	MAC Address.	c_6ZeroBytes	
PXT_MAC_VERSION	MAC Address.	3	
PXT_ROBUST_DIUC	Diuc shall for a robust burst profile.	5	

Table C.11: General parameter for SBC-REQ message

Parameter name	Parameter meaning	Default	Value for this test campaign
PXT_SBCREQ_RETRIES	The number of times SBC-REQ shall be sent without receiving SBC-RSP.	3	

Table C.12: Construction of the SBC-REQ message

Parameter name	Parameter meaning	Default	Value for this test campaign
PXT_SBCREQ_SS_TTG	Transmit transition gap TTG (in PSs) - only used if TDD or H-FDD.	1	
PXT_SBCREQ_SS_RTG	Receive transition gap RTG (in PSs) - only used if TDD or H-FDD.	1	
PXT_SBCREQ_MAXIMUN_TX_POWER	Max power values.	100 , 100 , 100 , 100	

Table C.13: Optional TLVs for SBC-REQ message

MAC PDU Capabilities			
Parameter name	**Parameter meaning**	**Default**	**Value for this test campaign**
PXT_SBCREQ_OPTIONAL1_PRESENT	Are the following TLV parameters needed for transmission. If false, it is not required to fulfil the corresponding items	true	
PXT_SBCREQ_MAC_PDU_CONSTRUCTION_CAP	Capabilities for Construction and Transmission of MAC PDUs	'00000010'B	

PKM transactions			
Parameter name	**Parameter meaning**	**Default**	**Value for this test campaign**
PXT_SBCREQ_OPTIONAL2_PRESENT	Are the following TLV parameters needed for transmission. If false, it is not required to fulfil the corresponding items	true	
PXT_SBCREQ_PKM_FLOW_CONTROL	The max number of outstanding PKM transactions supported	1	

Security associations			
Parameter name	**Parameter meaning**	**Default**	**Value for this test campaign**
PXT_SBCREQ_OPTIONAL3_PRESENT	Are the following TLV parameters needed for transmission. If false, it is not required to fulfil the corresponding items	true	
PXT_SBCREQ_MAX_NR_SEC_ASSOCIATIONS	The max number of simultaneous security associations	1	

Security Negotiation Parameters			
Parameter name	**Parameter meaning**	**Default**	**Value for this test campaign**
PXT_SBCREQ_OPTIONAL4_PRESENT	Are the following TLV parameters needed for transmission. If false, it is not required to fulfil the corresponding items	true	
PXT_SBCREQ_PKM_VERSION2_SUPPORT	PKM version 2 support	Supported	
PXT_SBCREQ_PKM_VERSION1_SUPPORT	PKM version 1 support	Supported	
PXT_SBCREQ_AEAPBASED_AUTHO_ATREENTRY	Authenticated EAP support at re-entry	Not supported	
PXT_SBCREQ_EAPBASED_AUTHO_ATREENTRY	EAP support at re-entry	Supported	
PXT_SBCREQ_RSABASED_AUTHO_ATREENTRY	RSA support at re-entry	Not supported	
PXT_SBCREQ_AEAPBASED_AUTHO_ATINITENTRY	Authenticated EAP support at init entry	Not supported	
PXT_SBCREQ_EAPBASED_AUTHO_ATINITENTRY	EAP support at init entry	Supported	
PXT_SBCREQ_RSABASED_AUTHO_ATINITENTRY	RSA support at init entry	Not supported	
PXT_SBCREQ_T96_BITSHORT_HMAC	T96 bitshort HMAC support	Supported	
PXT_SBCREQ_T80_BITSHORT_HMAC	T80 bitshort HMAC support	Supported	
PXT_SBCREQ_T64_BITSHORT_HMAC	T64 bitshort HMAC support	Supported	
PXT_SBCREQ_CMAC_SUPPORTED	CMAC support	Supported	
PXT_SBCREQ_HMAC_SUPPORTED	HMAC support	Supported	
PXT_SBCREQ_PN_WINDOW_SIZE	PN window size value	100	

Save power class types in sleep mode			
Parameter name	**Parameter meaning**	**Default**	**Value for this test campaign**
PXT_SBCREQ_OPTIONAL5_PRESENT	Are the following TLV parameters needed for transmission. If false, it is not required to fulfil the corresponding items	true	
PXT_SBCREQ_NR_OF_POWER_SAVE_CLASS_TYPE3	Power save class type 3	1	
PXT_SBCREQ_NR_OF_POWER_SAVE_CLASS_TYPE1AND2	Power save class type 1 and 2	2	
PXT_SBCREQ_POWER_SAVE_CLASS_TYPE3_SUPPORT	Power save class type 3 support	Supported	
PXT_SBCREQ_POWER_SAVE_CLASS_TYPE2_SUPPORT	Power save class type 2 support	Supported	
PXT_SBCREQ_POWER_SAVE_CLASS_TYPE1_SUPPORT	Power save class type 1 support	Supported	

Extension capability support			
Parameter name	**Parameter meaning**	**Default**	**Value for this test campaign**
PXT_SBCREQ_OPTIONAL6_PRESENT	Are the following TLV parameters needed for transmission. If false, it is not required to fulfil the corresponding items	true	
PXT_SBCREQ_EXTENSION_CAP_SUPPORT	Ext sub header support	Supported	

MS metrics support			
Parameter name	**Parameter meaning**	**Default**	**Value for this test campaign**
PXT_SBCREQ_OPTIONAL7_PRESENT	Are the following TLV parameters needed for transmission. If false, it is not required to fulfil the corresponding items	true	
PXT_SBCREQ_BS_RTD_SUPPORT	Bs RTD support	Supported	
PXT_SBCREQ_RELATIVE_DELAY_SUPPORT	Relative delay support	Supported	
PXT_SBCREQ_BS_RSSI_MEAN_SUPPORT	RSSI mean support	Supported	
PXT_SBCREQ_BS_CINR_MEAN_SUPPORT	CINR mean support	Supported	

MS association level support			
Parameter name	**Parameter meaning**	**Default**	**Value for this test campaign**
PXT_SBCREQ_OPTIONAL8_PRESENT	Are the following TLV parameters needed for transmission. If false, it is not required to fulfil the corresponding items	true	
PXT_SBCREQ_DIRECTED_ASSOCIATION_SUPPORT	Directed association support	Supported	
PXT_SBCREQ_ASSOCIATIONLEVEL_2	Association level 2 support	Supported	
PXT_SBCREQ_ASSOCIATIONLEVEL_1	Association level 1 support	Supported	
PXT_SBCREQ_ASSOCIATIONLEVEL_0	Association level 0 support	Supported	
PXT_SBCREQ_SCANNING_WITHOUT_ASSOCIATION	Scanning without association support	Supported	

Table C.14: OFDM parameters for the SBC-REQ message

Parameter name	Parameter meaning	Default	Value for this test campaign
PXT_SBCREQ_OFDM_FFT_SIZES	The FFT sizes supported	'000000'B , '1'B , '1'B	
PXT_SBCREQ_OFDM_DEMODULATOR	The demodulator options supported	'000'B , '0'B , '0'B , '0'B , '0'B , '0'B	
PXT_SBCREQ_OFDM_MODULATOR	The modulator options supported	'00'B , not Delayed '0'B , '0'B , '0'B , '0'B , '0'B	
PXT_SBCREQ_TC_SPT	TC layer support	'0000000'B , '1'B	

Table C.15: OFDMA parameters for the SBC-REQ message

Parameter name	Parameter meaning	Default	Value for this test campaign
PXT_SBCREQ_OFDMA_MAC_PARAMETER_SETA	Mac parameters Set A support	Supported	
PXT_SBCREQ_OFDMA_MAC_PARAMETER_SETB	Mac parameters Set B support	Not Supported	
PXT_SBCREQ_HARQ_PARAMETER_SET	HARQ parameters Set	Set 3	
PXT_SBCREQ_OFDMA_PHY_PARAMETER_SETA	PHY parameters Set A support	Supported	
PXT_SBCREQ_OFDMA_PHY_PARAMETER_SETB	PHY parameters Set B support	Not supported	

Annex D (normative): WiMAX/HiperMAN 1.3.1 PCTR Proforma for IUT BS

The PCTR proforma is based on ISO/IEC 9646-6 [7]. Any needed additional information can be found in this International standard document.

D.1 Identification summary

D.1.1 Protocol conformance test report

Table D.1

PCTR Number:	
PCTR Date:	
Corresponding SCTR Number:	
Corresponding SCTR Date:	
Test Laboratory Identification:	
Test Laboratory Manager:	
Signature:	

D.1.2 IUT identification

Table D.2

Name:	
Version:	
Protocol specification:	
PICS:	
Previous PCTR if any:	

D.1.3 Testing environment

Table D.3

PIXIT Number:	
ATS Specification:	
Abstract Test Method:	DTS/BRAN-004T008-3 clause 4
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

D.1.4 Limits and reservation

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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D.1.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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D.2 IUT Conformance status

This IUT has or has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause C.3 in the present document) and there are no "FAIL" verdicts to be recorded (in clause C.6 in the present document) strike the words "has or", otherwise strike the words "or has not".

D.3 Static conformance summary

The PICS for this IUT is or is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

D.4 Dynamic conformance summary

The test campaign did or did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause C.6 of the present document) strike the words "did or" otherwise strike the words "or did not".

Summary of the results of groups of test:

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D.5 Static conformance review report

If clause C.3 indicates non-conformance, this clause itemises the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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D.6 Test campaign report

Table D.4: BS test cases

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause D.7)
TC_BS_CDM_MFS_OPN_BV_H000a	**Yes/No**	**Yes/No**		
TC_BS_CDM_MFS_OPN_BV_H001a	**Yes/No**	**Yes/No**		
TC_BS_CDM_MFS_OPN_BV_H005	**Yes/No**	**Yes/No**		
TC_BS_CDM_CD_BV_H000	**Yes/No**	**Yes/No**		
TC_BS_CDM_CD_BV_H001	**Yes/No**	**Yes/No**		
TC_BS_CDM_CD_BV_H003	**Yes/No**	**Yes/No**		
TC_BS_RLC_IRNG_BV_H001	**Yes/No**	**Yes/No**		
TC_BS_RLC_IRNG_BI_H000	**Yes/No**	**Yes/No**		
TC_BS_RLC_SBC_BV_H000	**Yes/No**	**Yes/No**		
TC_BS_RLC_SBC_BV_H001	**Yes/No**	**Yes/No**		
TC_BS_SEC_PKMv2_AUTH_NWE_BV_H000	**Yes/No**	**Yes/No**		
TC_BS_SEC_PKMv2_AUTH_NWE_BV_H001	**Yes/No**	**Yes/No**		
TC_BS_SEC_PKMv2_AUTH_TEKI_BV_H004	**Yes/No**	**Yes/No**		
TC_BS_SEC_PKMv2_TEK_BV_H000	**Yes/No**	**Yes/No**		
TC_BS_SEC_PKMv2_TEK_BV_H001	**Yes/No**	**Yes/No**		
TC_BS_SEC_PKMv2_TEK_BV_H006	**Yes/No**	**Yes/No**		

D.7 Observations

Additional information relevant to the technical content of the PCTR is given here.

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Annex E (normative): WiMAX/HiperMAN 1.3.1 PCTR Proforma for IUT MS

The PCTR proforma is based on ISO/IEC 9646-6 [7]. Any needed additional information can be found in this International standard document.

E.1 Identification summary

E.1.1 Protocol conformance test report

Table E.1

PCTR Number:	
PCTR Date:	
Corresponding SCTR Number:	
Corresponding SCTR Date:	
Test Laboratory Identification:	
Test Laboratory Manager:	
Signature:	

E.1.2 IUT identification

Table E.2

Name:	
Version:	
Protocol specification:	
PICS:	
Previous PCTR if any:	

E.1.3 Testing environment

Table E.3

PIXIT Number:	
ATS Specification:	
Abstract Test Method:	TS 102 545-3, clause 4
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

E.1.4 Limits and reservation

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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E.1.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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E.2 IUT Conformance status

This IUT has or has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause C.3 in the present document) and there are no "FAIL" verdicts to be recorded (in clause C.6 in the present document) strike the words "has or", otherwise strike the words "or has not".

E.3 Static conformance summary

The PICS for this IUT is or is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

E.4 Dynamic conformance summary

The test campaign did or did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause C.6 of the present document) strike the words "did or" otherwise strike the words "or did not".

Summary of the results of groups of test:

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E.5 Static conformance review report

If clause C.3 indicates non-conformance, this clause itemises the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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E.6 Test campaign report

Table E.4: MS test cases

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause E.7)
TC_SS_RLC_IRNG_BV_H015	**Yes/No**	**Yes/No**		
TC_SS_RLC_IRNG_BV_H016	**Yes/No**	**Yes/No**		
TC_SS_RLC_IRNG_BV_H017	**Yes/No**	**Yes/No**		
TC_SS_RLC_IRNG_BV_H018	**Yes/No**	**Yes/No**		
TC_SS_RLC_SBC_BV_H000	**Yes/No**	**Yes/No**		
TC_SS_RLC_SBC_BV_H006	**Yes/No**	**Yes/No**		
TC_SS_RLC_SBC_TI_H000	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_AUTH_NWE_BV_H001	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_AUTH_NWE_BV_H003	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_AUTH_NWE_BV_H005	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H000	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H002	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H003	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H005	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H010	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H011	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H016	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H017	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H018	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H020	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H021	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H022	**Yes/No**	**Yes/No**		
TC_SS_SEC_PKMv2_TEK_FSM_BV_H023	**Yes/No**	**Yes/No**		

E.7 Observations

Additional information relevant to the technical content of the PCTR is given here.

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Annex F (informative): Bibliography

- IETF RFC 2131: "Dynamic Host Configuration Protocol".
- IETF RFC 868: "Time Protocol".
- IETF RFC 1123: "Requirements for Internet Hosts - Application and Support".
- IETF RFC 2349: "TFTP Timeout Interval and Transfer Size Options".

History

Document history		
V1.1.1	September 2007	Publication