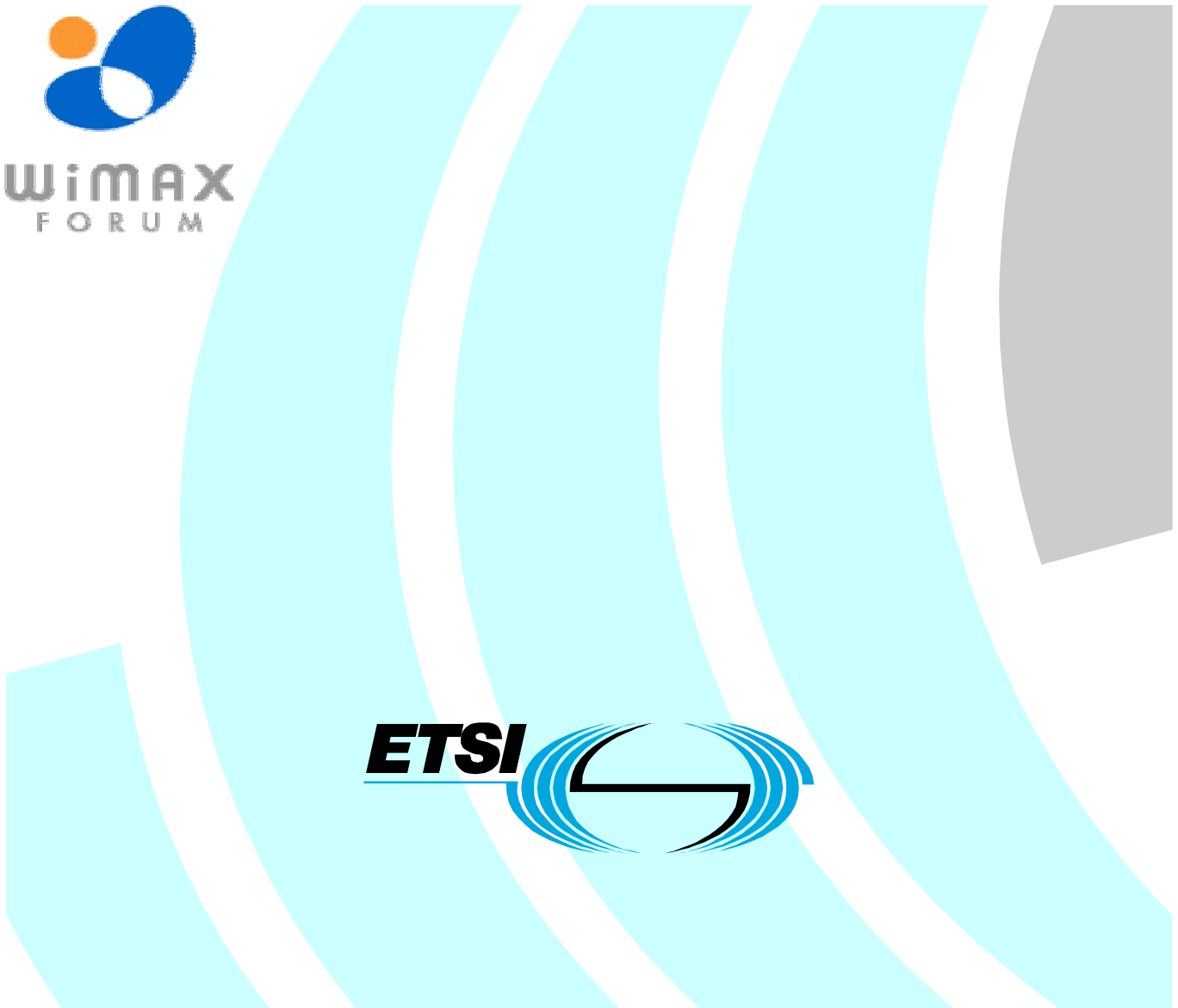
ETSI TS 102 385-2 V2.1.1 (2005-12)

Technical Specification

Broadband Radio Access Networks (BRAN);
HiperMAN/WiMAX;
Conformance testing for the Data Link Control Layer (DLC);
Part 2: Test Suite Structure and
Test Purposes (TSS&TP) specification



Reference
RTS/BRAN-004T002-2R1

Keywords
broadband, DLC, FWA, HiperMAN, radio, testing, TSS&TP

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
Sous-Préfecture de Grasse (06) N° 7803/88

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

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

The present document specifies the Test Suite Structure and Test Purposes (TSS&TP) for High PERformance Radio Metropolitan Area Network (HiperMAN) and WiMAX.

The present document has been developed on the basis of preceding versions of HiperMAN and WiMAX TSS&TP documents and makes the previous versions obsolete.

The present document is part 2 of a multi-part deliverable covering Broadband Radio Access Networks (BRAN); HiperMAN/WiMAX; Conformance testing for the Data Link Control Layer (DLC), as identified below:

Part 1: "Procotol Implementation Conformance Statement (PICS) proforma";

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

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

1 Scope

The present document contains the Test Suite Structure (TSS) and Test Purposes (TP) to test the BRAN HiperMAN/WiMAX DLC/MAC layer.

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

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [4] and ISO/IEC 9646-2 [5]) as well as the ETSI rules for conformance testing (ETS 300 406 [3]) are used as a basis for the test methodology.

All references to [2] imply the text as amended by [8].

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.

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

[2] IEEE P802.16-2004: "IEEE Standard for Local and metropolitan area networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems".

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

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

[5] 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".

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

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

[8] 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 [7], TS 102 178 [1] and IEEE P802.16-2004 [2] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ISO/IEC 9646-1 [4], ISO/IEC 9646-6 [6], ISO/IEC 9646-7 [7], TS 102 178 [1], IEEE P802.16-2004 [2] and the following apply:

BS	Base Station
CID	Connection Identifier
CS	Convergence Sublayer
DL	DownLink
FDD	Frequency Division Duplexing
IE	Information Element
OFDM	Orthogonal Frequency Division Multiplexing
PMP	Point-to-MultiPoint
QoS	Quality of Service
REQ	REQuest
RLC	Radio Link Control
RNG	RaNGing
RSP	ReSPonse
SS	Subscriber Station
TDD	Time Division Duplexing
UL	UpLink

4 Test Suite Structure (TSS)

4.1 Structure

Figure 1 shows the DLC Test Suite Structure (TSS) including its subgroups defined for conformance testing.

Group	Function	Sub-function
Channel Descriptors and Maps		
	Map and frame Structure	
		Initialization
		Operational
		Relevance
	Channel Descriptors	
	Channel Descriptor Change	
Radio Link Control		
	Initial Ranging	
	Periodic Ranging	
	Downlink Burst Profile Management	
	Negotiate Basic Capabilities	
Registration, IP connectivity and TFTP		
	Registration	
	IP Connectivity	
Privacy and Key Management		
	Authentication/ Authorization	
		Initialization
		Operational

Group	Function	Sub-function
	TEK	
		Initialization
		Operational
	Security Association Management	
	Encryption and Key Scheduling	
		Key Usage
		Encryption
		Decryption
Dynamic Services		
	Dynamic Service Addition	
	Dynamic Service Change	
	Dynamic Service Deletion	
Bandwidth Allocation and Polling		
	Request/Grant	
	Multicast Polling	
Reset and Re-registration		
Clock Comparison		
MAC PDU		
	Packing	
	Fragmentation	
	PDU concatenation	
	CRC	
	ARQ	
Packet CS		
	Packet CS Usage	
	Classification	
	Classifier DSx Signalling	
	Payload Header Suppression	

Figure 1: TSS for HiperMAN/WiMAX DLC/MAC

The test suite is structured as a tree with the root defined as DLC-BS or DLC-SS representing the protocol groups "DLC for BS" or "DLC for SS". The tree is of rank 3 with the first rank a Group, the second a Function, and the third a sub-function. The third rank is broken down into the standard ISO conformance test categories CA, BV, BI, BO and TI (discussed below).

4.2 Test groups

Each test group has a total of three levels. The first level is the protocol services. The second level separates the protocol services into the various functional areas. The third level are the sub-functional areas. The fourth level, if required, is used to indicate the initiator (BS or SS) or the direction of communication (DL or UL). This fourth level is not shown in figure 1.

4.2.1 Protocol services

The protocol groups identify the DLC protocol services given in TS 102 178 [1] and IEEE P802.16-2004 [2].

4.2.1.1 Channel descriptors and maps

This protocol group contains the test purposes for the DCD, UCD, DL-MAP, AND UL-MAP messages that provide channel parameters and burst mapping. Such functions as Scanning for the Downlink Channel and Obtaining Uplink Parameter are included.

4.2.1.2 Radio Link Control (RLC)

This protocol group contains the test purposes for Initial Ranging/Automatic Adjustments, Negotiating Basic Capabilities, Periodic Ranging, and Downlink Profile management.

4.2.1.3 Registration, IP connectivity, and TFTP

This protocol group includes the test purposes for Registration during Initialization, IP Connectivity during Initializations, Time of Day Establishment, and the Transfer of Operational Parameters.

4.2.1.4 Privacy and key management

The functions included in this protocol group are Authentication/Authorization, Certification, Reauthorization, TEK Exchange, TEK Update, TEK Scheduling, Security Association Management, Encryption, and Decryption.

4.2.1.5 Dynamic services

Dynamic service addition, change, and deletion for both BS-Initiated and DS-Initiated behaviour are in this protocol group.

4.2.1.6 Bandwidth allocation and polling

This protocol group includes the bandwidth request/grant functions for stand-alone, piggyback and focused contention.

4.2.1.7 Reset and re-registration

Reset and re-registration functions are included in this protocol group.

4.2.1.8 Clock comparison

The clock comparison function in this group is used in network systems with service flows carrying information that requires the SSs to reconstruct their network clock signals; e.g. DS1 and DS3.

4.2.1.9 MAC PDU Construction

The functions included in this protocol group are PDU Packing, Fragmentation, Concatenation, CRC Use, ARQ Reset, ARQ Receive, and ARQ Transmit.

4.2.1.10 Packet Convergence Sublayer

The service specific packet Convergence Sublayer (CS) resides on top of the MAC sublayer and utilizes, via the MAC SAP, the services provided by the MAC sublayer. The CS performs the following functions:

- Accepting higher-layer PDUs.
- Classifying higher-layer PDUs.
- Processing (if necessary) classified higher-layer PDUs.
- Delivering PDUs to the appropriate MAC SAP.

4.2.1.11 DLC MAC Sublayer

The MAC sublayer provides the core MAC functionality of system access, bandwidth allocation, connection establishment, and connection maintenance. It receives data from the various convergence sublayers classified to particular MAC connections. QoS is applied to the transmission and scheduling of data over the PHY. The MAC sublayer also performs authentication, secure key exchange, and encryption management.

4.2.2 Main test types

The main test types are the valid behaviour group, the invalid behaviour group and the inopportune behaviour group.

4.2.2.1 Valid Behaviour (BV) tests

This test group shall verify that the IUT reacts in conformity with the base specifications after receipt or exchange of valid Protocol Data Units (PDUs). Valid PDUs means that the exchange of messages and the content of the exchanged messages are considered as valid.

4.2.2.2 Invalid Behaviour (BI) tests

This test sub group shall verify that the IUT reacts in conformity with the TS after receipt of a syntactically invalid PDU.

4.2.2.3 Inopportune Behaviour (BO) tests

This test sub group shall verify that the IUT reacts in conformity with the TS after receipt of a syntactically correct PDU not expected in the actual message exchange.

4.2.2.4 Timer and counter (TI) tests

This test group shall verify that the IUT reacts in conformity with the TS after expiry of a defined timer or counter.

5 Test Purposes (TP)

5.1 Introduction

5.1.1 TP definition conventions

The TPs are defined by the rules shown in table 1.

Table 1: TP definition rules

TP definition item	Item description
TP Id	The TP Id is a unique identifier formed according to the TP naming conventions defined in the clause below.
P802.16 Reference	A pointer to the base specification requirement from which the TP is derived (specification reference, clause, and paragraph).
PICS Item	The PICS item(s) associated with this TP.
Initial Condition	The IUT's state to which the TP is applied.
Expected behaviour	Definition of the events that are expected from the IUT pursuant to the base specification given a certain stimulus.
Notes	Additional optional information provided to the TP reader.

5.1.2 TP Identifier naming conventions

The identifier of the TP is built according to table 2.

Table 2: TP naming convention

Identifier:	**TP/<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, etc.)

5.1.3 Sources of TP definitions

All TPs are specified according to IEEE P802.16-2004 [2] with Corrigenda up to the -D3 version and supplemented by TS 102 178 [1]. In the event of conflict between these three references, the requirements of IEEE P802.16-2004 [2] were used. Unless otherwise noted, all references shown in the TPs are from to IEEE P802.16-2004 [2].

The scope of the current document was refined during its development and is now fixed as the subset of IEEE P802.16-2004 [2] that specifically concerns the current WiMAX and BRAN/HiperMAN concepts. The following presents the included and excluded functions:

- Included functionality:
  - PMP-only.
  - OFDM PHY-only.
  - Adaptive antenna support (PMP-specific).
  - All privacy features.
  - ARQ.
  - CRC.
  - Fragmentation.
  - Multicast.
  - Bandwidth allocation (PMP-specific).
  - Channel description (PMP-specific).
  - Clock comparison (PMP-specific).
  - Contention resolution (PMP-specific).
  - DL burst profile management (PMP-specific).
  - Dynamic services (PMP-specific).
  - Network entry and initialization (PMP-specific).
  - Packing.
  - PHY layer support (PMP-specific).
  - Packet CS.
  - Polling (PMP-specific).
  - Reports.
  - Service Flow (PMP-specific).
  - Uplink scheduling (PMP-specific).
  - License-exempt operation.
  - PHS.
- Excluded functionality:
  - Mesh mode.
  - ATM CS.

5.2 Test purposes for BS (BS)

5.2.1 Channel Descriptors and Maps (CDM)

5.2.1.1 Map and Frame Structure (MAP)

TP ID	TP/BS/CDM/MAP/BV-H000
P802.16 Reference	Clauses 6.3.2.3.2 and 8.3.5.1.
PICS Item	
Initial Condition	IUT is operating.
Expected Behaviour	Check that: IUT transmits valid DL-MAP messages within Lost DL-MAP Interval.
Test strategy	Straightforward.
Notes	

TP ID	TP/BS/CDM/MAP/BV-H001
P802.16 Reference	Clauses 6.3.2.3.4 and 8.3.5.1.
PICS Item	
Initial Condition	IUT is operating.
Expected Behaviour	Check that: When transmitting a UL-MAP, the IUT places the UL-MAP - either immediately following the DL-MAP (if one is present); or - immediately following the DLFP.
Test strategy	Straightforward. Can be done before TE synchronizes.
Notes	Follows directly from clause 8.3.5.1.

TP ID	TP/BS/CDM/MAP/BV-H002
P802.16 Reference	Clause 8.3.5.1.
PICS Item	
Initial Condition	IUT is operating in TDD mode.
Expected Behaviour	Check that: The IUT correctly decodes UL messages in the UL sub frame whose start position is different across successive frames.
Test strategy	Test Strategy 1: 1) Establish a DS UL data flow. 2) Provoke BS to transmit DL and UL-MAPs that change the end of the DL sub frame and the start of the UL sub frame across successive frames. 3) For each frame, IUT sends UL data per the UL-MAP 4) Assign PASS for each frame if UL data received is the same as that passed. Test Strategy 2 (requires that IUT is DSC-capable): 1) Establish a DS UL data flow with identical DL and UL sub frames across successive frames. 2) Provoke BS to initiate a DSC transaction for the service flow to change transmission parameters. 3) Upon the successful DSC transaction negotiation (DSC-ACK, CC=OK), assign PASS if IUT if UL data received is the same as that passed after the DSC is effective.
Notes	

5.2.1.2 Channel Descriptors (CD)

TP ID	TP/BS/CDM/CD/BV-H000
P802.16 Reference	Clauses 6.3.2.3.1 and 10.1 (DCD Interval).
PICS Item	
Initial Condition	IUT is operating.
Expected Behaviour	Check that: IUT transmits with period DCD Interval seconds DCD messages containing correct parameters and downlink burst profile(s).
Test strategy	Straightforward.
Notes	

TP ID	TP/BS/CDM/CD/BV-H001
P802.16 Reference	Clauses 6.3.2.3.3 and 10.1 (UCD Interval).
PICS Item	
Initial Condition	IUT is operating.
Expected Behaviour	Check that: IUT periodically transmits valid UCD messages with period UCD Interval seconds.
Test strategy	Straightforward.
Notes	If license-exempt operation then Frequency (Type =3) is not part of UCD (clause 6.3.15.7).

TP ID	TP/BS/CDM/CD/BV-H002
P802.16 Reference	Clauses 6.3.15.7 and 10.1 (DCD Interval).
PICS Item	
Initial Condition	IUT is operating license-exempt.
Expected Behaviour	Check that: IUT transmits with period DCD Interval seconds DCD messages containing correct license-exempt parameters and downlink burst profile(s).
Test strategy	Straightforward.
Notes	1) License-exempt parameters for DCD are Channel Number and Channel Switch Frame Number from DCD Channel Encoding table in clause11.4.1. 2) DCD requires other non license-exempt specific parameters as well (see same table).

5.2.1.3 Channel Descriptor Change (CDC)

To be published in the next TSS/TP version.

5.2.2 Radio Link Control (RLC)

5.2.2.1 Initial Ranging (IRNG)

TP ID	TP/BS/RLC/IRNG/BV-H000
P802.16 Reference	Clauses 6.3.2.3.4 and 8.3.6.3.
PICS Item	
Initial Condition	IUT is operating.
Expected Behaviour	Check that: IUT transmits UL-MAPs containing Initial Ranging UL-MAP IEs.
Test strategy	Straightforward.
Notes	

TP ID	TP/BS/RLC/IRNG/BV-H001
P802.16 Reference	Clauses 6.3.2.3.6 and 6.3.9.5.1. Table "Ranging and Automatic Adjustments Procedure Table".
PICS Item	
Initial Condition	IUT is operating and transmitting UL-MAPs with Initial Ranging IEs.
Expected Behaviour	Check that: On receiving a RNG-REQ with the Initial Ranging CID in an Initial Ranging opportunity that requires timing and power adjustments, the IUT: 1) transmits a RNG-RSP on the Initial Ranging CID containing Basic CID, Primary CID, Status = Continue, Timing Adjustments, and Power Adjustments; and 2) subsequently transmits an Initial Ranging interval for the Basic CID in the RNG-RSP.
Test strategy	Straightforward: 1) IUT will send the Initial Ranging interval for the new Basic CID in a frame following the RNG-RSP.
Notes	1) Subchannelized ranging mechanism is not operating for this TP.

TP ID	TP/BS/RLC/IRNG/BV-H002
P802.16 Reference	Clauses 6.3.2.3.6 and 6.3.9.5.1.
PICS Item	
Initial Condition	IUT is operating and transmitting UL-MAPs with Initial Ranging IEs for a given Basic CID.
Expected Behaviour	Check that: On receiving a RNG-REQ with the given Basic CID in an Initial Ranging opportunity within tolerances, the IUT: 1) transmits a RNG-RSP on the Basic CID containing Status = Success; and 2) subsequently transmits UL-MAPs IEs on the Basic CID for Data Burst Grant Types (UIUC = 5..12).
Test strategy	Straightforward.
Notes	

TP ID	TP/BS/RLC/IRNG/BV-H009
P802.16 Reference	Clause 6.3.7.4.3.2
PICS Item	
Initial Condition	IUT is operating.
Expected Behaviour	Check that: After transmitting a UCD message with n as the Ranging Back off Start value and Ranging Request Opportunity Size, the IUT provides 2nd initial ranging opportunities summed over the current and following frames. The size of each transmission opportunity shall be equal to "Contention Ranging Request Opportunity Size" and the size of the "Contention Request Burst Size" shall be an integer multiple of a transmission opportunity.
Test strategy	1) Count and sum the number of initial ranging opportunities issued in current and following frames. 2) Assign PASS if sum exceeds 2nd and the opportunity/grant is equal to the Ranging Request Opportunity Size and the size of the "Contention Request Burst Size" shall be an integer multiple of a transmission opportunity.
Notes	

TP ID	TP/BS/RLC/IRNG/BV-H010
P802.16 Reference	Clause 6.3.9.6 and figure "Initial Ranging - SS (part 2)".
PICS Item	
Initial Condition	IUT is operating, has received a valid initial RNG-REQ on CID = 0, and has transmitted a RNG-RSP (continue) on CID=0.
Expected Behaviour	Check that: On receiving an identical initial RNG-REQ on CID = 0, the IUT retransmits the RNG-RSP (continue) message containing transmission parameter adjustments on CID = 0.
Test strategy	Straightforward.
Notes	

TP ID	TP/BS/RLC/IRNG/BV-H011
P802.16 Reference	Clause 6.3.9.6.
PICS Item	
Initial Condition	IUT is operating and in Initial Ranging for an SS.
Expected Behaviour	Check that: On receiving a RNG-REQ message containing anomalies, BS continues the polled initial ranging phase until the maximum ranging correction retries are exhausted.
Test strategy	Straightforward.
Notes	

TP ID	TP/BS/RLC/IRNG/TI-H000
P802.16 Reference	Clauses 6.3.9.5.1, 6.3.9.6, figure "Initial Ranging, Polled Phase-BS" and 10.1 "Invited Ranging Retries".
PICS Item	
Initial Condition	IUT is operating and has started Polled Initial Ranging
Expected Behaviour	Check that: On sending "Invited Ranging Retries" Initial Ranging intervals on the Basic CID (polled ranging) and having received no RNG-REQ to any of the polled ranging opportunities, the IUT transmits a RNG-RSP (abort).
Test strategy	1) TE sends initial RNG-REQ on CID=0 in an Initial Ranging Interval with transmission power sufficient for IUT to decode RNG-REQ but requiring a RNG-RSP(continue) from IUT, not a RNG-RSP(success). 2) IUT sends RNG-RSP(continue) with power adjustments. 3) TE remains silent and does not respond to any of the Polled Initial ranging opportunities. 4) Assign PASS verdict if IUT sends RNG-RSP(abort) after it sends "Invited Ranging Retries" Initial Ranging intervals.
Notes	

TP ID	TP/BS/RLC/IRNG/TI-H001
P802.16 Reference	Clause 6.3.9.5.1, 6.3.9.6, figure "Initial Ranging, Polled Phase-BS" and 10.1 "Ranging Correction Retries".
PICS Item	
Initial Condition	IUT is operating and has started Polled Initial Ranging.
Expected Behaviour	Check that: After "Ranging Correction Retries" repetitions of sending Initial Ranging intervals on the Basic CID (polled ranging), receiving a RNG-REQ requiring power corrections for each of the polled ranging opportunities, and sending a RNG-RSP(continue), the IUT transmits a RNG-RSP(abort).
Test strategy	1) TE sends initial RNG-REQ on CID=0 in an Initial Ranging Interval with transmission power sufficient for IUT to decode RNG-REQ but requiring a RNG-RSP(continue) from IUT, not a RNG-RSP(success). 2) For Ranging Correction Retries, loop through the following: - IUT transmits polled Initial Ranging interval on TE's Basic CID. - TE transmits RNG-REQ at transmission characteristics forcing IUT to transmit RNG-RSP (continue). - IUT sends RNG-RSP(continue) with power adjustments. 3) IUT sends one more polled Initial Ranging opportunity on TE's Basic CID. 4) TE transmits one more RNG-REQ at transmission characteristics forcing IUT to transmit RNG-RSP (continue). 5) Assign PASS verdict if IUT sends RNG-RSP(abort).
Notes	

5.2.2.2 Periodic Ranging (PRNG)

TP ID	TP/BS/RLC/PRNG/BV-H000
P802.16 Reference	
PICS Item	
Initial Condition	
Expected Behaviour	
Test strategy	
Notes	This TP is under discussion and the CR reflecting the result of the discussion is planned to be issued for approval by October 15th 2005.

TP ID	TP/BS/RLC/PRNG/BV-H001
P802.16 Reference	
PICS Item	
Initial Condition	
Expected Behaviour	
Test strategy	
Notes	This TP is under discussion and the CR reflecting the result of the discussion is planned to be issued for approval by October 15th 2005.

TP ID	TP/BS/RLC/PRNG/BV-H002
P802.16 Reference	Clause 6.3.10.1.
PICS Item	
Initial Condition	IUT is operating and a DL service flow is established.
Expected Behaviour	Check that: On receiving a RNG-REQ message on the Basic CID to change the DL transmission to a more robust burst profile, the IUT transmits a RNG-RSP.
Test strategy	1) Change transmission characteristics to cause a change to the more robust burst profile. 2) Assign PASS if IUT sends RNG-RSP.
Notes	

TP ID	TP/BS/RLC/PRNG/BV-H003
P802.16 Reference	
PICS Item	
Initial Condition	
Expected Behaviour	
Test strategy	
Notes	This TP is under discussion and the CR reflecting the result of the discussion is planned to be issued for approval by October 15th 2005.

TP ID	TP/BS/RLC/PRNG/BV-H004
P802.16 Reference	
PICS Item	
Initial Condition	
Expected Behaviour	
Test strategy	
Notes	This TP is under discussion and the CR reflecting the result of the discussion is planned to be issued for approval by October 15th 2005.

5.2.2.3 Downlink Burst Profile Management (DBPC)

To be published in the next TSS/TP version.

5.2.2.4 Negotiate Basic Capabilities (SBC)

TP ID	TP/BS/RLC/SBC/BV-H000
P802.16 Reference	Clause 6.3.9.7.
PICS Item	
Initial Condition	IUT is initializing and has just completed Initial Ranging.
Expected Behaviour	Check that: On receiving an SBC-REQ message on the Basic CID, the IUT transmits an SBC-RSP with the intersection of the IUT's and TE's capabilities set to "on".
Test strategy	Straightforward.
Notes	

5.2.3 Registration, IP Connectivity, and Parameter Transfer (INI)

5.2.3.1 Registration (REG)

To be published in the next TSS/TP version.

5.2.3.2 IP Connectivity (IPC)

To be published in the next TSS/TP version.

5.2.4 Privacy and Key Management (PKM)

5.2.4.1 Authentication/Authorization (AUTH)

To be published in the next TSS/TP version.

5.2.4.2 Encryption Key Transfer (TEK)

To be published in the next TSS/TP version.

5.2.4.3 Security Association Management (SAM)

To be published in the next TSS/TP version.

5.2.4.4 Encryption and Key Scheduling (EKS)

To be published in the next TSS/TP version.

5.2.5 Dynamic Services (DS)

5.2.5.1 Dynamic Services Addition (DSA)

TP ID	TP/BS/DS/DSA/BV-H000
P802.16 Reference	Clause 6.3.14.9.2.
PICS Item	
Initial Condition	IUT has completed initialization and is operating.
Expected Behaviour	Check that the IUT: To initiate a DL service flow, sends a valid DSA-REQ with valid DL parameters.
Test strategy	Straightforward.
Notes	Requires a means to provoke the IUT to start the DSA transaction with a DSA-REQ.

TP ID	TP/BS/DS/DSA/BV-H001
P802.16 Reference	Clause 6.3.14.9.2.
PICS Item	
Initial Condition	IUT has completed initialization and is operating.
Expected Behaviour	Check that the IUT: To initiate an UL service flow, sends a valid DSA-REQ with valid UL parameters.
Test strategy	Straightforward.
Notes	Requires a means to provoke the IUT to start the DSA transaction with a DSA-REQ.

TP ID	TP/BS/DS/DSA/BV-H003
P802.16 Reference	Clause 6.3.14.9.2.
PICS Item	
Initial Condition	IUT is operating and has initiated establishing a DL service flow by sending a DSA-REQ with DL parameters.
Expected Behaviour	Check that the IUT: On receipt of a DSA-RSP containing the Confirmation Code set to OK/success, sends a DSA-ACK containing the Confirmation Code set to OK/success.
Test strategy	Straightforward.
Notes	Requires a means to provoke the IUT to start the DSA transaction with a DSA-REQ.

TP ID	TP/BS/DS/DSA/BV-H004
P802.16 Reference	Clause 6.3.14.9.2.
PICS Item	
Initial Condition	IUT is operating and has initiated establishing a UL service flow by sending a DSA-REQ with UL parameters.
Expected Behaviour	Check that the IUT: On receipt of a DSA-RSP containing the Confirmation Code set to OK/success, sends a DSA-ACK containing the Confirmation Code set to OK/success.
Test strategy	Straightforward.
Notes	Requires a means to provoke the IUT to start the DSA transaction with a DSA-REQ.

5.2.5.2 Dynamic Services Change (DSC)

To be published in the next TSS/TP version.

5.2.5.3 Dynamic Services Deletion (DSD)

TP ID	TP/BS/DS/DSD/BV-H000
P802.16 Reference	Clause 6.3.14.9.5.2.
PICS Item	
Initial Condition	IUT has completed initialization and is operating. A DL service flow is established.
Expected Behaviour	Check that the IUT: When it wishes to delete an established DL Service flow, sends a DSD-REQ.
Test strategy	Straightforward
Notes	Requires a means to provoke the IUT to delete the service flow with a DSD-REQ.

TP ID	TP/BS/DS/DSD/BV-H001
P802.16 Reference	Clause 6.3.14.9.5.2.
PICS Item	
Initial Condition	IUT has completed initialization and is operating. A UL service flow is established.
Expected Behaviour	Check that the IUT: When it wishes to delete an established UL Service flow, sends a DSD-REQ.
Test strategy	
Notes	Requires a means to provoke the IUT to delete the service flow with a DSD-REQ.

5.2.5.4 QoS Parameter Sets (QPS)

To be published in the next TSS/TP version.

5.2.6 Bandwidth Allocation and Polling (BWA)

5.2.6.1 Request/Grant (REQ)

TP ID	TP/BS/BWA/REQ//BV-H000
P802.16 Reference	Clauses 6.3.2.1.2 and 6.3.6.1.
PICS Item	
Initial Condition	IUT is operating and an UL service flow with Best Effort (BE) scheduling is established.
Expected Behaviour	Check that: On receiving a Bandwidth Request Header of aggregate type, the IUT transmits one or more uplink bandwidth grants satisfying the request.
Test strategy	Straightforward.
Notes	

TP ID	TP/BS/BWA/REQ//BV-H001
P802.16 Reference	Clauses 6.3.2.1.2 and 6.3.6.1.
PICS Item	
Initial Condition	IUT is operating and an UL service flow with Best Effort (BE) scheduling is established.
Expected Behaviour	Check that: On receiving a Bandwidth Request Header of incremental type, the IUT transmits one or more uplink bandwidth grants satisfying the request.
Test strategy	Straightforward.
Notes	

TP ID	TP/BS/BWA/REQ//BV-H002
P802.16 Reference	Clause 8.3.7.3.1.
PICS Item	
Initial Condition	IUT is operating. Focused Contention is not supported.
Expected Behaviour	Check that: On allocating a transmission opportunity to request bandwidth, the IUT transmits a Request Region Full IE (a UL-MAP IE with UIUC=2) in the UL-MAP.
Test strategy	Straightforward.
Notes	Requires a means to provoke the IUT to allocate a bandwidth request opportunity.

TP ID	TP/BS/BWA/REQ//BV-H003
P802.16 Reference	Clause 8.3.7.3.1.
PICS Item	
Initial Condition	IUT is operating. Focused Contention is not supported. IUT has transmitted a Request Region Full IE in the UL-MAP.
Expected Behaviour	Check that: On receiving a Bandwidth Request Header in the region indicated by the Request Region Full IE, the IUT transmits one or more uplink grants for the requested bandwidth satisfying the request.
Test strategy	Straightforward.
Notes	

TP ID	TP/BS/BWA/REQ//BV-H004
P802.16 Reference	Clauses 6.3.2.1.2 and 6.3.6.1.
PICS Item	
Initial Condition	IUT is operating and an UL service is established.
Expected Behaviour	Check that: On receiving a Bandwidth Request Header in an uplink grant allocation for UIUC=5...12, the IUT transmits one or more uplink grants for the requested bandwidth satisfying the request.
Test strategy	Straightforward.
Notes	

5.2.6.2 Multicast Polling (MCP)

To be published in the next TSS/TP version.

5.2.7 Reset and Re-registration (RER)

To be published in the next TSS/TP version.

5.2.8 Clock Comparison (CCC)

To be published in the next TSS/TP version.

5.2.9 MAC PDU Construction (MAC)

5.2.9.1 Packing (PACK)

To be published in the next TSS/TP version.

5.2.9.2 Fragmentation (FRAG)

To be published in the next TSS/TP version.

5.2.9.3 PDU Concatenation (CAT)

To be published in the next TSS/TP version.

5.2.9.4 Cyclic Redundancy Check (CRC)

To be published in the next TSS/TP version.

5.2.9.5 ARQ (ARQ)

To be published in the next TSS/TP version.

5.2.10 Packet Convergence Sublayer (PCS)

5.2.10.1 Packet CS Usage (PCU)

To be published in the next TSS/TP version.

5.2.10.2 Classification (CLS)

To be published in the next TSS/TP version.

5.2.10.3 Classifier DSx Signalling (CDS)

To be published in the next TSS/TP version.

5.2.10.4 Payload Header Suppression (PHS)

To be published in the next TSS/TP version.

5.3 Test purposes for SS (SS)

5.3.1 Channel Descriptors and Maps (CDM)

5.3.1.1 Map and Frame Structure (MAP)

5.3.1.1.1 Initialization (INIT)

TP ID	TP/SS/CDM/MAP/INIT/BV-H000
P802.16 Reference	Clause 6.3.9.1.
PICS Item	
Initial Condition	IUT is turned off. The IUT has not previously acquired a downlink channel.
Expected Behaviour	Check that: When switched on, the IUT scans the possible channels until it finds a valid downlink signal.
Test strategy	This TP is untestable without an Upper Tester. The TP is implicitly tested during the Initial Ranging and subsequent tests. If the IUT does not acquire a downlink channel, it cannot receive any PDUs from the TE.
Notes	

TP ID	TP/SS/CDM/MAP/INIT/BV-H002
P802.16 Reference	Clause 6.3.9.1.
PICS Item	
Initial Condition	IUT is turned on and has begun scanning. The IUT has found a valid downlink channel.
Expected Behaviour	Check that: The IUT correctly decodes the DL-MAP.
Test strategy	This TP is untestable without an Upper Tester. It is implicitly tested during the Initial Ranging and subsequent tests. If the IUT does not decode a DL-MAP, it cannot receive any PDUs from the TE.
Notes	

5.3.1.1.2 Operational (OPN)

TP ID	TP/SS/CDM/MAP/OPN/BV-H000
P802.16 Reference	Clause 6.3.3.2.
PICS Item	
Initial Condition	The IUT is generating MAC PDUs for management messages, user data, and bandwidth request.
Expected Behaviour	Check that: On receiving a UL-MAP allowing sufficient space to concatenate two or more MAC PDUs into the same uplink burst, the IUT concatenates the PDUs into the uplink burst.
Test strategy	1) Establish 2 uplink service flows. 2) TE sends 2 UL-MAP IEs per frame, each one sufficient for one of the service flows. 3) Interim verdict is PASS if the IUT delivers the uplink data for each service flow per the UL-MAP IEs. 4) TE then sends one UL-MAP IE per frame sufficiently large for both service flows to be transmitted in the same burst. 5) Verdict is PASS if the IUT places the uplink data for both service flows into the uplink burst per the UL-MAP IE.
Notes	1) Packing must be OFF for this test.

5.3.1.1.3 Relevance (RLV)

TP ID	TP/SS/CDM/MAP/RLV/BV-H000
P802.16 Reference	Clause 6.3.7.5.
PICS Item	
Initial Condition	The IUT has scanned and synchronized to the DL-MAPs.
Expected Behaviour	Check that: On receiving UL-MAPs with minimum relevance (Allocation Start Time) granting bandwidth to the SS, the IUT correctly transmits MAC PDUs per the UL grant.
Test strategy	Unless otherwise noted, the grants for UL messages and the DCD and UCD messages necessary for operation are implicitly incorporated in the strategy. 1) The IUT has scanned and found a valid DL-MAP message with its configured BS ID. 2) The IUT then transmits a valid RNG-REQ message in an Initial Ranging Interval with a CID=0. 3) The TE then transmits a RNG-RSP with Status = Continue and the Basic and Primary CIDs. 4) The TE then transmits in a later frame an UL-MAP with minimum relevance for the Basic CID. 5) The pass verdict is assigned if the IUT transmits a valid Ranging Request per the UL-MAP for the Basic CID in the same frame as the UL-MAP's frame.
Notes	

TP ID	TP/SS/CDM/MAP/RLV/BV-H001
P802.16 Reference	Clause 6.3.7.5.
PICS Item	
Initial Condition	The IUT has scanned and synchronized to the DL-MAPs.
Expected Behaviour	Check that: On receiving UL-MAPs with maximum relevance (Allocation Start Time) granting bandwidth to the SS, the IUT correctly transmits MAC PDUs per the UL grant.
Test strategy	Unless otherwise noted, the grants for UL messages and the DCD and UCD messages necessary for operation are implicitly incorporated in the strategy. 1) The IUT has scanned and found a valid DL-MAP message with its configured BS ID. 2) The IUT then transmits a valid RNG-REQ message in an Initial Ranging Interval with a CID=0. 3) The TE then transmits a RNG-RSP with the Basic and Primary CIDs. 4) The TE then transmits in a later frame an UL-MAP MAPs with maximum relevance for the Basic CID. 5) The pass verdict is assigned if the IUT transmits a valid Ranging Request per the UL-MAP for the Basic CID in the frame following the UL-MAP's frame.
Notes	

5.3.1.2 Channel Descriptors (CD)

TP ID	TP/SS/CDM/CD/BV-H000
P802.16 Reference	Clauses 6.3.9.2, 6.3.2.3.1 and 11.4.2.
PICS Item	
Initial Condition	The IUT has just synchronized and received a valid DCD.
Expected Behaviour	Check that: The IUT responds to DL MAC PDUs received on the downlink PHY parameters and DL Burst Profiles contained in the DCD.
Test strategy	Unless otherwise noted, the grants for UL messages and the DCD and UCD messages necessary for operation are implicitly incorporated in the strategy. 1) The IUT is configured to initialize with the TE. 2) The TE transmits DL-MAPs followed by a DCD message in the DCD Interval with given downlink PHY parameters and DL Burst Profile. 3) IUT sends a RNG_REQ. 4) TE sends a RNG_RSP in accordance with the downlink PHY parameters and the chosen DL Burst profile. 5) The intermediate test verdict is assigned on the IUT transmitting a valid SBC-REQ (indicating that Burst Profile identified in the DCD was interpreted correctly by the IUT). 6) The IUT is switched off and then back on to initialize with the TE. 7) The TE transmits DL-MAPs followed by a DCD message in the DCD Interval with downlink PHY parameters and DL Burst Profiles different from the given parameters and profiles in step (2) above. 8) The test verdict is assigned on the IUT transmitting a valid RNG-REQ.
Notes	

TP ID	TP/SS/CDM/CD/BV-H001
P802.16 Reference	Clauses 6.3.9.3 and 6.3.2.3.3.
PICS Item	
Initial Condition	The IUT has just synchronized.
Expected Behaviour	Check that: When the IUT receives a valid UCD message, the IUT transmits MAC PDUs per the uplink PHY parameters and UL Burst Profiles in the UCD.
Test strategy	1) The IUT is configured to initialize with the TE. 2) The TE transmits UL-MAPs followed by a UCD message in the UCD Interval. 3) The IUT transmits a valid RNG-REQ. The test verdict is on the TE-received RNG-REQ's uplink PHY parameters and UL Burst Profile.
Notes	

5.3.1.3 Channel Descriptor Change (CDC)

To be published in the next TSS/TP version.

5.3.2 Radio Link Control (RLC)

5.3.2.1 Initial Ranging (IRNG)

TP ID	TP/SS/RLC/IRNG/BV-H000
P802.16 Reference	Clause 6.3.9.5.1.
PICS Item	
Initial Condition	The IUT is synchronized and UL and DL parameters are established.
Expected Behaviour	Check that: The IUT transmits a RNG-REQ with CID=0 in the nth Transmission Opportunity where n is a random value in the range $0 < n < (2^m - 1)$. "m" is the value in the latest UCD message's Ranging Backoff Start field.
Test strategy	1) The TE transmits valid DCD, DL-MAP, and UCD during sufficient time to allow the IUT to become synchronized and to establish UL and DL parameters. The TE also transmits UL-MAP messages that do not contain Initial Ranging Intervals. 2) The TE then transmits UL-MAPs containing Initial Ranging Intervals. 3) A PASS verdict is assigned if the IUT transmits a valid RNG-REQ with CID=0 in one of the UL-MAP's Initial Ranging Intervals with backoff.
Notes	

TP ID	TP/SS/RLC/IRNG/BV-H001
P802.16 Reference	Clause 6.3.9.5.
PICS Item	
Initial Condition	The IUT has started Initial Ranging and has transmitted the first RNG-REQ message on the Initial Ranging CID (zero).
Expected Behaviour	Check that: On receiving a RNG-RSP message with timing and power corrections and the Status field set to Continue, the IUT applies the power and timing corrections and transmits a RNG-REQ using the Basic CID in the RNG-RSP message in an invited Initial Ranging Interval.
Test strategy	Straightforward.
Notes	

TP ID	TP/SS/RLC/IRNG/BV-H002
P802.16 Reference	Clause 6.3.9.5.1.
PICS Item	
Initial Condition	The IUT is in Initial Ranging and has just transmitted a RNG-REQ message.
Expected Behaviour	Check that: On receiving a RNG-RSP message containing Status = Continue and timing adjustments, the IUT incorporates the timing adjustments to transmit a RNG-REQ message.
Test strategy	Straightforward.
Notes	

TP ID	TP/SS/RLC/IRNG/BV-H100
P802.16 Reference	Clause 6.3.9.6 and figure "Initial Ranging-SS (part 2)".
PICS Item	
Initial Condition	The IUT is in Initial Ranging and has just transmitted at maximum power a RNG-REQ message.
Expected Behaviour	Check that: On receiving a RNG-RSP message containing Status = Continue and an increase in power, the IUT transmits a RNG-REQ in the next grant (UIUC=1) on its Basic CID with Ranging Anomalies set to "SS already at maximum power".
Test strategy	Straightforward.
Notes	

TP ID	TP/SS/RLC/IRNG/BV-H101
P802.16 Reference	Clause 6.3.9.6 and figure "Initial Ranging-SS (part 2)".
PICS Item	
Initial Condition	The IUT is in Initial Ranging and has just transmitted at minimum power a RNG-REQ message.
Expected Behaviour	Check that: On receiving a RNG-RSP message containing Status = Continue and a decrease in power, the IUT transmits a RNG-REQ in the next grant (UIUC=1) on its Basic CID with Ranging Anomalies set to "SS already at minimum power".
Test strategy	Straightforward.
Notes	

TP ID	TP/SS/RLC/IRNG/BV-H102
P802.16 Reference	Clause 6.3.9.6 and figure "Initial Ranging-SS (part 2)".
PICS Item	
Initial Condition	The IUT is in Initial Ranging and has just transmitted RNG-REQ message.
Expected Behaviour	Check that: On receiving a RNG-RSP message containing Status = Continue with timing adjustments whose sum is too large, the IUT transmits a RNG-REQ in the next grant (UIUC=1) on its Basic CID with Ranging Anomalies set to "Sum of commanded timing adjustments is too large".
Test strategy	Straightforward.
Notes	

TP ID	TP/SS/RLC/IRNG/BV-H105
P802.16 Reference	Clause 6.3.9.5.1 and figure "Initial Ranging-SS (part 2)".
PICS Item	
Initial Condition	The IUT is Initial Ranging and has transmitted a RNG-REQ message.
Expected Behaviour	Check that: On receiving a RNG-RSP message with Status = Abort and not containing a DL Frequency Override TLV, the IUT scans for the next DL channel and resets the MAC layer.
Test strategy	1) Straightforward up to the TE sending the RNG-RSP message with the criteria in the Test Purpose. 2) Begin transmitting DL-MAPs, DCDs, UL-MAPs, and UCDs on the next DL channel. 3) Assign a PASS if the IUT transmits a RNG-REQ on the DL channel used in (2) and with a CID=0.
Notes	

5.3.2.2 Periodic Ranging (PRNG)

TP ID	TP/SS/RLC/PRNG/BV-H000
P802.16 Reference	
PICS Item	
Initial Condition	
Expected Behaviour	
Test strategy	
Notes	This TP is under discussion and the CR reflecting the result of the discussion is planned to be issued for approval by October 15th 2005.

TP ID	TP/SS/RLC/PRNG/BV-H001
P802.16 Reference	
PICS Item	
Initial Condition	
Expected Behaviour	
Test strategy	
Notes	This TP is under discussion and the CR reflecting the result of the discussion is planned to be issued for approval by October 15th 2005.

TP ID	TP/SS/RLC/PRNG/BV-H100
P802.16 Reference	
PICS Item	
Initial Condition	
Expected Behaviour	
Test strategy	
Notes	This TP is under discussion and the CR reflecting the result of the discussion is planned to be issued for approval by October 15th 2005.

TP ID	TP/SS/RLC/PRNG/BV-H101
P802.16 Reference	
PICS Item	
Initial Condition	
Expected Behaviour	
Test strategy	
Notes	This TP is under discussion and the CR reflecting the result of the discussion is planned to be issued for approval by October 15th 2005.

5.3.2.3 Downlink Burst Profile Management (DBPC)

To be published in the next TSS/TP version.

5.3.2.4 Negotiate Basic Capabilities (SBC)

TP ID	TP/SS/RLC/SBC/BV-H000
P802.16 Reference	Clause 6.3.9.7.
PICS Item	
Initial Condition	The IUT has completed Initial Ranging.
Expected Behaviour	Check that: The IUT transmits a valid SBC-REQ on its Basic CID containing the Physical Parameters and Bandwidth Allocation Support.
Test strategy	Straightforward.
Notes	

TP ID	TP/SS/RLC/SBC/BV-H001
P802.16 Reference	Clauses 6.3.2.3.24 and 6.3.9.7.
PICS Item	
Initial Condition	The IUT has completed Initial Ranging and has transmitted a valid SBC-REQ on its Basic CID containing the Physical Parameters and Bandwidth Allocation Support.
Expected Behaviour	Check that: On receiving an SBC-RSP containing an identical set of the IUT's SBC-REQ capabilities parameters set to "on", the IUT transmits: - either valid AUTH-INFO and AUTH-REQ; - or a REG-REQ when Authorization is unsupported.
Test strategy	Check that: On receiving an SBC-RSP containing an identical set of the IUT's SBC-REQ capabilities parameters set to "on", the IUT transmits: - either valid AUTH-INFO and AUTH-REQ; - or a REG-REQ when Authorization is unsupported.
Notes	

5.3.3 Registration, IP Connectivity, and Parameter Transfer (INI)

5.3.3.1 Registration (REG)

TP ID	TP/SS/INI/REG/BV-H000
P802.16 Reference	Clauses 6.3.2.3.7 and 6.3.9.9.
PICS Item	
Initial Condition	The IUT is initializing and has negotiated Basic Capabilities where SS Authorization and Key Exchange are not required.
Expected Behaviour	Check that: On receiving an UL bandwidth grant, the IUT sends a valid REG-REQ message.
Test strategy	1) Perform initialization. During the SBC transaction, the TE sets Authorization Policy Support to "Not Supported" (clause 11.8.5). 2) Straightforward hereafter assuming that Authorization and Key Exchange are not required.
Notes	

5.3.3.2 IP Connectivity (IPC)

To be published in the next TSS/TP version.

5.3.4 Privacy and Key Management (PKM)

5.3.4.1 Authentication/Authorization (AUTH)

5.3.4.1.1 Initialization (INIT)

To be published in the next TSS/TP version.

5.3.4.1.2 Operational (OPN)

To be published in the next TSS/TP version.

5.3.4.2 Encryption Key Transfer (TEK)

5.3.4.2.1 Initialization (INIT)

To be published in the next TSS/TP version.

5.3.4.2.2 Operational (OPN)

To be published in the next TSS/TP version.

5.3.4.3 Security Association Management (SAM)

To be published in the next TSS/TP version.

5.3.4.4 Encryption and Key Scheduling (EKS)

5.3.4.4.1 Key Usage (KU)

To be published in the next TSS/TP version.

5.3.4.4.2 Encryption (ENC)

To be published in the next TSS/TP version.

5.3.4.4.3 Decryption (DEC)

To be published in the next TSS/TP version.

5.3.5 Dynamic Services (DS)

5.3.5.1 Dynamic Services Addition (DSA)

TP ID	TP/SS/DS/DSA/BV-H000
P802.16 Reference	Clauses 6.3.14.7.1.2 and 6.3.2.3.11.
PICS Item	
Initial Condition	The IUT has completed initialization and is now operational.
Expected Behaviour	Check that: For each uplink grant scheduling type (e.g. BE, nrtPS, etc.) the IUT supports, on receiving a DSA-REQ containing all necessary Service Flow Parameters and Convergence Sub layer Parameters and HMAC Tuple to establish an UL service flow, the IUT transmits a valid DSA-RSP with a Confirmation Code set to OK/success.
Test strategy	Straightforward.
Notes	

TP ID	TP/SS/DS/DSA/BV-H001
P802.16 Reference	Clauses 6.3.14.7.1.2 and 6.3.2.3.11.
PICS Item	
Initial Condition	The IUT has completed initialization and is now operational.
Expected Behaviour	Check that: On receiving a DSA-REQ containing all necessary Service Flow Parameters and Convergence Sub layer Parameters and HMAC Tuple to establish a DL service flow, the IUT transmits a valid DSA-RSP with a Confirmation Code set to OK/success.
Test strategy	Straightforward.
Notes	

TP ID	TP/SS/DS/DSA/BV-H002
P802.16 Reference	Clauses 6.3.14.7.1.2 and 6.3.2.3.12.
PICS Item	
Initial Condition	A BS-initiated DSA transaction has started. The IUT has received a valid DSA-REQ for an UL service flow and sent a valid DSA-RSP accepting the DSA.
Expected Behaviour	Check that: For each uplink grant scheduling type (e.g. BE, nrtPS, etc.) the IUT supports, on receiving a DSA-ACK with Confirmation Code set to OK/success; the IUT is able to transmit service flow data on the connection.
Test strategy	Straightforward up to the point where the IUT begins transmitting data. Requires the IUT to have an application or another means to begin sending data over the service flow.
Notes	

TP ID	TP/SS/DS/DSA/BV-H003
P802.16 Reference	Clauses 6.3.14.7.1.2 and 6.3.2.3.12.
PICS Item	
Initial Condition	A BS-initiated DSA transaction has started. The IUT has received a valid DSA-REQ for a DL service flow and sent a valid DSA-RSP accepting the DSA.
Expected Behaviour	Check that: On receiving a DSA-ACK with Confirmation Code set to OK/success; the IUT is able to receive service flow data on the connection.
Test strategy	Straightforward.
Notes	

5.3.5.2 Dynamic Services Change (DSC)

To be published in the next TSS/TP version.

5.3.5.3 Dynamic Services Deletion (DSD)

TP ID	TP/SS/DS/DSD/BV-H000
P802.16 Reference	Clauses 6.3.14.9.5.2 and 6.3.2.3.17.
PICS Item	
Initial Condition	IUT is operational and a DL DS flow is established.
Expected Behaviour	Check that: On receiving a DSD-REQ for the established DL DS flow, the IUT transmits a valid DSD-RSP and deletes the service flow.
Test strategy	Straightforward.
Notes	

TP ID	TP/SS/DS/DSD/BV-H001
P802.16 Reference	Clauses 6.3.14.9.5.2 and 6.3.2.3.17.
PICS Item	
Initial Condition	IUT is operational and an UL DS flow is established.
Expected Behaviour	Check that: On receiving a DSD-REQ for the established UL service flow, the IUT transmits a valid DSD-RSP and deletes the service flow.
Test strategy	Straightforward.
Notes	

5.3.5.4 Qos Parameter Sets (QPS)

To be published in the next TSS/TP version.

5.3.6 Bandwidth Allocation and Polling (BWA)

5.3.6.1 Request/Grant (REQ)

TP ID	TP/SS/BWA/REQ/BV-H000
P802.16 Reference	Clause 6.3.3.7, table "OFDM UIUC values" and 8.3.5.1.
PICS Item	
Initial Condition	The IUT is operational. No DS flow is established. No MAC management message protocol exchanges are in process.
Expected Behaviour	Check that: On receiving a UL-MAP for its Basic CID, the IUT transmits one of the following per the UIUC in the UL-MAP: - Either the value 0xFF in each unused byte of the UL bandwidth grant. - Or formatting the unused space as a MAC PDU containing the Padding CID. The CI, EC, HT, and Type fields shall be set to zero. The length field shall be set to the number of unused bytes (including the size of the MAC header created for the padding MAC PDU) in the data burst The HCS shall be computed in the normal way. - Or a Bandwidth Header Request with BR=0 on the IUT's Basic CID.
Test strategy	Straightforward. UIUC values are in the range 5..12.
Notes	

TP ID	TP/SS/BWA/REQ/BV-H001
P802.16 Reference	Clauses 8.3.5.5 and 6.3.2.3.4.
PICS Item	
Initial Condition	The IUT is operational and a Dynamic UL Service flow is established.
Expected Behaviour	Check that: Upon receiving a UL-MAP, the IUT transmits the service flow's MAC DATA PDUs per the Uplink Burst Profile corresponding to the UIUC in the UL-MAP.
Test strategy	1) Establish an UL service flow. 2) TE transmits UL-MAPs containing IEs granting Bandwidth to the IUT. 3) Verdict is assigned on IUT transmitting the MAC DATA PDU(s) for this service flow per the Uplink Burst Profile for each successive UL-MAP. UIUC values are in the range 5..12.
Notes	

TP ID	TP/SS/BWA/REQ/BV-H002
P802.16 Reference	Clauses 6.3.3.7, table "OFDM UIUC values" and 8.3.5.1.
PICS Item	
Initial Condition	The IUT is operational. A UL service flow is established and data is being passed on the flow.
Expected Behaviour	Check that: Upon receiving a UL-MAP granting bandwidth larger than the service flow requires, the IUT transmits per the UIUC in the UL-MAP the service flow data and does one of the following with remaining space of the UL grant bandwidth: - Either fills each unused byte with the value 0xFF. - Or formats the unused space as a MAC PDU containing the Padding CID. The CI, EC, HT, and Type fields shall be set to zero. The length field shall be set to the number of unused bytes (including the size of the MAC header created for the padding MAC PDU) in the data burst The HCS shall be computed in the normal way. - Or a Bandwidth Header Request with BR=0 on the IUT's Basic CID.
Test strategy	Straightforward. UIUC values are in the range 5..12.
Notes	

TP ID	TP/SS/BWA/REQ/BV-H003
P802.16 Reference	Clause 6.3.6.1.
PICS Item	
Initial Condition	The IUT is operational. An UL service flow is established. No MAC management message protocol exchanges are in process.
Expected Behaviour	Check that: On having data packets to transmit on the UL service flow and on receiving a UL-MAP IE for REQ Region Full, the IUT transmits a bandwidth request using REG Region-Full.
Test strategy	1) Bring the IUT to operational state. 2) Do not allocate grants to IUT. At the same time, provoke the IUT to send data packets for the UL service flow. 3) Transmit a UL-MAP with a REQ Region Full IE. 4) Assign PASS if IUT transmits a full contention bandwidth request in the REG Region-Full.
Notes	

TP ID	TP/SS/BWA/REQ/BV-H004
P802.16 Reference	Clause 6.3.6.1.
PICS Item	
Initial Condition	The IUT is operational. An UL service flow is established. The IUT receives grants.
Expected Behaviour	Check that: On having additional data packets for the UL service flow and on receiving a UL-MAP IE with the IUT's Basic CID and a UIUC in the range (5..12) and a REQ Region-Full, the IUT transmits one of the following to request bandwidth: - Either a bandwidth request header message in a REQ Region Full. - Or a bandwidth request header message in a burst with UIUC = (5..12). - Or a piggyback bandwidth request.
Test strategy	1) Bring the IUT to operational state. 2) Establish an UL service flow. 3) Provoke the IUT to send data packets on the service flow. 4) Transmit a UL-MAP with a REQ Region Full UIUC in an IE and an IE with the IUT's Basic CID and UIUC = (5..12). 5) Assign PASS: - if IUT transmits a bandwidth request message in a REQ Region Full; or - IUT transmits a bandwidth request header message in a burst with UIUC = (5..12); or - IUT transmits a piggyback bandwidth request.
Notes	

5.3.6.2 Multicast Polling (MCP)

To be published in the next TSS/TP version.

5.3.7 Reset and Re-registration (RER)

To be published in the next TSS/TP version.

5.3.8 Clock Comparison (CCC)

To be published in the next TSS/TP version.

5.3.9 MAC PDU Construction (MAC)

5.3.9.1 Packing (PACK)

To be published in the next TSS/TP version.

5.3.9.2 Fragmentation (FRAG)

To be published in the next TSS/TP version.

5.3.9.3 PDU Concatenation (CAT)

To be published in the next TSS/TP version.

5.3.9.4 Cyclic Redundancy Check (CRC)

To be published in the next TSS/TP version.

5.3.9.5 ARQ (ARQ)

To be published in the next TSS/TP version.

5.3.10 Packet Convergence Sublayer (PCS)

5.3.10.1 Packet CS Usage (PCU)

To be published in the next TSS/TP version.

5.3.10.2 Classification (CLS)

To be published in the next TSS/TP version.

5.3.10.3 Classifier DSx Signalling (CDS)

To be published in the next TSS/TP version.

5.3.10.4 Payload Header Suppression (PHS)

To be published in the next TSS/TP version.

Annex A (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	February 2005	Publication
V2.1.1	December 2005	Publication