Protocol Implementation Conformance Statement for IEEE Standard 802.16-2001

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Foreword

This PICS proforma has been produced by the Worldwide Interoperability for Microwave Access (WiMAX) Forum.

This document is sub-part 1 of a multi-part deliverable covering IEEE 802.16 Fixed Broadband Radio Access Systems, as identified below:

Sub-part 1: Protocol Implementation Conformance Statements (PICS) proforma

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

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

Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a telecommunications specification. Such a statement is called a protocol Implementation Conformance Statement (PICS)

1. Scope

The present document provides the Protocol Implementation Conformance Statements (PICS) proforma for IEEE 802.16 systems as defined in IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”, in accordance with the relevant guidance given in ISO/IEC 9646-7: “Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements”.

It details in tabular form the implementation options for the defined system profiles.

2. References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document. References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific. For a specific reference, subsequent revisions do not apply. For a non-specific reference, the latest version applies.

IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”

ISO/IEC 9646-1: “Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts”

ISO/IEC 9646-7: “Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements”

IEEE P802.16c/D2-2002: “Draft Amendment to IEEE Standard for Local and Metropolitan Area Networks – Part 16: Air Interface for Broadband Fixed Wireless Access Systems – Detailed System profiles for 10-66 GHz”

3. Definitions and Abbreviations

3.1 Definitions

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

terms defined in IEEE Std 802.16-2001 (12/6/2001): "Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems";
terms defined in ISO/IEC 9646-1: "Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts"
terms defined in ISO/IEC 9646-7: "Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements".

In particular, the following terms defined in ISO/IEC 9464-1 apply:

Implementation Conformance Statement (ICS): statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented. The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, information object ICS, etc.
ICS proforma: document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS.
Protocol ICS (PICS): ICS for an implementation or system claimed to conform to a given protocol specification.

3.2 Abbreviations

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

abbreviations defined in IEEE Std 802.16-2001 (12/6/2001): "Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems"

4. Conformance to this PICS Proforma Specification

If it claims to conform to the present document, the actual PICS proforma to be filled in by a supplier shall be technically equivalent to the text of the PICS proforma given in Annex A, and shall preserve the numbering, naming, and ordering of the proforma items.

A PICS which conforms to the present document shall be a conforming PICS proforma completed in accordance with the guidance for completion given in clause A.1.

Annex A (Normative) : Protocol ICS for IEEE 802.16-2001

A.1 Guidance for completing PICS Proforma

A.1.1 Purposes and Structure

The purpose of this PICS proforma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems” may provide information about the implementation in a standardized manner.

The PICS proforma is subdivide into subclauses for the following categories of information:

guidance for completing the PICS proforma;
identification and implementation;
identification of the standard;
global statement of conformance
roles
Subscriber Station (SS)
Base Station (BS)

A.1.2 Abbreviations and Conventions

Item column

The Item column contains a number which identifies the item in the table.

Capability column

The capability column describes in free text each respective item (e.g., parameters, timers, etc.). It implicitly means “Is <capability> supported by the implementation?”.

Reference column

The reference column indicates the section of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems” from which the requirement for the capability is derived.

Status column

The following notations, defined in ISO/IEC 9646-7 , are used in the status column:

m	Mandatory – the capability is required to be supported
o	Optional – the capability may be supported or not
n/a	Not applicable – in the given context, it is impossible to use the capability
x	Prohibited (excluded) – there is a requirement not to use this capability in the given context
o.i	Qualified option – for mutually exclusive or selectable options from a set. "i" is an integer which identifies a group of related optional items and the logic of their selection which is defined immediately following the table
ci	Conditional – the requirement on the capability ("m", "o", "x", or "n/a") depends on the support of other optional or conditional items. "i" is an integer identifying a conditional status expression which is defined immediately following the table.
i	Irrelevant (out of scope) – capability outside the scope of the reference specification. No answer is requested from the supplier.

Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7 , are used for the support column:

Y or y	Supported by implementation.
N or n	Not supported by implementation.
N/A, n/a or -	No answer required (allowed only if the status is n/a either directly or after the evaluation of a conditional status).

If this PICS proforma is completed in order to describe a multiple profile implementation, it may be necessary to answer that a capability is supported for one profile and not supported for another. In that case, the supplier shall enter a unique reference to a conditional expression, preceded by "?" (e.g., ?3). This expression shall be given in the space provided for comments at the bottom of the table. It uses the predicates defined in Profile Definitions, each of which refers to a single profile or a family of profiles and which takes the value TRUE if and only if that profile is to be used.

EXAMPLE: ?3: If profM1 then Y else N

Note: As stated in ISO/IEC 9646-7, support for a received PDU requires the ability to parse all valid parameters of that PDU. Supporting a PDU while having no ability to parse a valid parameter is non-conformant. Support for a parameter on a PDU means that the semantics of that parameter are supported.

Values allowed column

The values allowed column is only used when necessary in a table. It contains the type, the list, the range, or the length of values allowed. The following notations are used:

Range of values: Example:	<min value>..<max value> 5..20
List of values: Example 1: Example 2: Example 3:	<value1>, <value2>, …, <valueN> 2, 4, 6, 8, 9 1101b, 1011b, 1111b 0x0A, 0x34, 0x2F
List of named values: Example:	<name1>(<val1>), <name2>(<val2>), …, <nameN>(<valN>) reject(1), accept(2)
Length: Example:	Size (<min size>..<max size>) Size (1..8)

Values supported column

The values supported column is only present when the values allowed column is present. It shall be filled in by the supplier of the implementation. In this column, the value or the ranges of values supported by the implementation shall be indicated.

Reference to items

For each possible item answer in the support column within the PICS proforma a unique reference exists which may be used, for example, in conditional expressions. It is defined as the table identifier, followed by the "/" character, followed by the item number in the table. If there is more than one support column in a table, the columns are discriminated by letters (a, b, etc.).

Example:	Table A5/4 is the reference to the answer of item 4 in Table A5.
Example:	Table A6/3b is the reference to the second answer (i.e., in the second support column) of item 3 in Table A.6.

Prerequisite Line

A prerequisite line takes the form:

Prerequisite: <predicate>

A prerequisite line after a clause or table title indicates that the entire clause or the entire table is not required to be completed if the predicate is FALSE.

A.1.3 Instructions for completing the PICS Proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in the support or values supported column boxes provided, using the notation described in section Abbreviations and Conventions.

However, tables contained in section Subscriber Station shall only be completed for Subscriber Station (SS) implementations, and tables contained in section Base Station shall only be filled in for Base Station implementations.

If necessary, the supplier may provide additional comments in space at the bottom of the tables or separately.

A.2 Identification of the Implementation

Identification of the Implementation Under Test (IUT) and the system in which it resides (the System Under Test (SUT)) should be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product supplier and client information should both be filled in if they are different.

A person who can answer queries regarding information supplied in the PICS should be named as the contact person.

A.2.1 Date of Statement

A.2.2 Implementation Under Test (IUT) Identification

IUT name:
IUT version:

A.2.3 System Under Test (SUT) Identification

SUT name:
Hardware configuration:
Operating system:

A.2.4 Product Supplier

Name:
Address:
Telephone number:
Facsimile number:
E-mail address:
Additional information:

A.2.5 Client (if different from product supplier)

Name:
Address:
Telephone number:
Facsimile number:
E-mail address:
Additional information:

A.2.6 PICS Contact Person

(A person to contact if there are any queries concerning the content of the PICS.)

Name:
Telephone number:
Facsimile number:
E-mail address:
Additional information:

A.3 Identification of the Standard

This PICS proforma applies to the following standard:

IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”

as amended by:

IEEE P802.16c/D2-2002: “Draft Amendment to IEEE Standard for Local and Metropolitan Area Networks – Part 16: Air Interface for Broadband Fixed Wireless Access Systems – Detailed System profiles for 10-66 GHz”.

A.3.1 Profiles

IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”, section 12 defines system profiles. There are separate profiles for the MAC and the PHY layers. The profiles that are defined are:

Basic ATM MAC profile
Basic packet MAC profile
US 25 MHz channel PHY profile
European 28 MHz channel PHY profile

Table A1 defines the profile reference identifiers for use in this PICS proforma.

Table A1—Profile Definitions

Identifier	Description	Status	Support
profM1	Basic ATM MAC profile	o.1	
profM2	Basic packet MAC profile	o.1	
profP1	US 25 MHz channel PHY profile	o.2	
profP1f	US 25 MHz channel PHY profile - FDD	c1	
profP1t	US 25 MHz channel PHY profile - TDD	c1	
profP2	European 28 MHz channel PHY profile	o.2	
ProfP2f	European 28 MHz channel PHY profile - FDD	c2	
profP2t	European 28 MHz channel PHY profile - TDD	c2	

o.1: It is mandatory to support at least one of these items.
o.2: It is mandatory to support at least one of these items.
c1: If profP1 then it is mandatory to support at least one of these items.
c2: If profP2 then it is mandatory to support at least one of these items.

A.4 Global Statement of Conformance

Are all mandatory capabilities implemented? (Yes/No)

Note: Answering “No” to this question indicates non-conformance to IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming, on pages attached to the PICS proforma.

A.5 Roles

Table A2—Roles

Item	Role	Status	Support
1	Subscriber Station (SS)	o.1	
2	Base Station (BS)	o.1	

o.1: It is mandatory to support exactly one of these items.

A.6 Subscriber Station

Prerequisite: Table A2/1

This subclause contains the PICS proforma tables related to the Subscriber Station. They need to be completed for description of SS implementations only.

A.6.1 Major SS Capabilities and Functionalities of the MAC

A.6.1.1 Convergence Sublayers

This subclause covers the requirements in section 5 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.6.1.1.1 ATM Convergence Sublayer

This subclause covers the requirements of section 5.1 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A3—ATM Convergence Sublayer Capabilities

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VP switched mode classification	5.1.2.2.1	m	
2	VC switched mode classification	5.1.2.2.2	m	
3	Payload Header Suppression - VP mode	5.1.2.3.1	m	
4	Payload Header Suppression – VC mode	5.1.2.3.2	m	
5	ATM UNI Signaling	5.1.2.4	x	
6	CCS connection setup	5.1.2.4	c1	

c1: If Table A3/5 THEN m ELSE x

A.6.1.1.2 Packet Convergence Sublayer

This subclause covers the requirements of section 5.2 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A4—Packet Convergence Sublayer Protocol Support

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	IPv4	5.2	m	
2	IPv6	5.2	o	
3	802.3 Ethernet	5.2	o	
4	802.1Q VLAN	5.2	o	
5	IPv4 over 802.3 Ethernet	5.2	c1	
6	IPv6 over 802.3 Ethernet	5.2	c1	
7	IPv4 over 802.1Q VLAN	5.2	c2	
8	IPv6 over 802.1Q VLAN	5.2	c2	

c1: If Table A4/3 THEN o ELSE i
c2: If Table A4/4 THEN o ELSE i

Table A5—Packet Convergence Sublayer Capabilities

Item	Capability	Reference	Status	Support
1	Assign packets to the correct connection based on device ingress physical port in the uplink direction		m	
2	Forward packets to the correct physical interface based on the SFID (CID)		m	
3	IPv4 classification	5.2.7.2	m	
4	IPv6 classification	5.2.7.2	c2	
5	802.3 Ethernet classification	5.2.5.2	c3	
6	802.1Q VLAN Classification	5.2.6.2	c4	
7	Payload header suppression support	5.2.4	o	

c2: If A4/2 OR Table A4/6 OR THEN Table A4/8 o ELSE i //IPv6 support
c3 If Table A4/3 OR Table A4/5 OR THEN Table A4/6 o ELSE i //Ethernet support
c4: If Table A4/4 OR Table A4/7 OR THEN Table A4/8 o ELSE i //802.1Q support

Table A6—SS IP Classification in the uplink

Prerequisite: Table A5/3 OR Table A5/4 SS supports IP classification

Item	Capability	Reference	Status	Support
1	Classification based on IP Destination Address prefix	11.4.9.3	o	
2	Classification based on IP Source Address prefix	11.4.9.3	o	
3	Classification based on IP Protocol/Next Header field	11.4.9.3	o	
4	Classification based on DSCP /IP TOS field	11.4.9.3	o	
5	Classification based on transport protocol destination port	11.4.9.3	o	
6	Classification based on transport protocol source port	11.4.9.3	o	

Table A7—SS Ethernet Classification in the uplink

Prerequisite: Table A5/5 SS supports Ethernet IEEE 802.3 classification

Item	Capability	Reference	Status	Support
1	Classification based on Destination Address	11.4.9.3	o	
2	Classification based on Source Address	11.4.9.3	o	
3	Classification based on Ethertype/SAP	11.4.9.3	o	

Table A8—SS 802.1Q Classification in the uplink

Prerequisite: Table A5/6 SS supports 802.1Q Classification

Item	Capability	Reference	Status	Support
1	Classification based on 802.1D Priority Range	11.4.9.3	o	
2	Classification based on 802.1Q VLAN ID	11.4.9.3	o	

A.6.1.2 Addressing and Connections

This subclause covers the requirements of section 6.2.1 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A9—Addressing and Connections

Item	Capability	Reference	Status	Support
1	Globally Unique SS MAC Address	6.2.1	m	
2	MAC Management messages only on applicable CIDs	6.2.1	m	
3	TFTP during initialization on the secondary management connection	6.2.1	m	
4	DHCP for SS IP address establishment and maintenance on the secondary management connection	6.2.1	m	
5	Time protocol on secondary management connection	6.2.1	m	
6	User data only on transport connections	6.2.1	m	

A.6.1.3 Construction and Transmission of MAC PDUs

This subclause covers the requirements of section 6.2.3 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.6.1.3.1 Conventions

Table A10—Transmission Conventions

Item	Capability	Reference	Status	Support
1	Transmit messages most significant byte first	6.2.3.1	m	
2	Transmit bytes most significant bit first	6.2.3.1	m	

A.6.1.3.2 PDU Concatenation

Table A11—PDU Concatenation

Item	Capability	Reference	Status	Support
1	Concatenate Multiple MAC PDUs into a single burst of the length commanded by the UL-MAP.	6.2.3.2	m	
2	Receive concatenated MAC PDUs and determine disposition via CID.	6.2.3.2	m	

A.6.1.3.3 SDU Fragmentation

Table A12—SDU Fragmentation

Item	Capability	Reference	Status	Support
1	Fragment a MAC SDU into multiple MAC PDUs	6.2.3.3	m	
2	Correctly set the FC bits	6.2.3.3	m	
3	Increment the FSM modulo 8	6.2.3.3	m	
4	Receive and reassemble fragmented SDUs.	6.2.3.3	m	
5	Discard SDUs corrupted due to loss of fragment	6.2.3.3	m	
6	Fragmentation of PDUs on Basic and Initial Ranging connections	6.2.2.3	x	

A.6.1.3.4 Packing

Table A13—Packing

Item	Capability	Reference	Status	Support
1	Pack Fixed length PDUs	6.2.3.4.1	c2	
2	Receive (unpack) fixed length PDUs	6.2.3.4.1	c1	
3	Pack variable length PDUs	6.2.3.4.2	o	
4	Receive (unpack) variable length PDUs	6.2.3.4.2	m	
5	Pack variable length PDUs with fragmentation	6.2.3.4.2	c3	
6	Receive (unpack) variable length PDUs with fragmentation	6.2.3.4.2	m	
7	Packing of PDUs on Basic and Initial Ranging connections	6.2.2.3	x	

c1: If profM1 THEN m ELSE I
c2: If profM1 THEN o ELSE I
c3: If Table A13/3 THEN o ELSE n/a

A.6.1.3.5 CRC

Table A14—CRC

Item	Capability	Reference	Status	Support
1	Compute and add CRC	6.2.3.5	c1	
2	Check CRC	6.2.3.5	c1	

c1: If profM2 then m else o

A.6.1.4 Uplink Scheduling Service

This subclause covers the requirements of section 6.2.5 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A15— Uplink Scheduling Service

Item	Capability	Reference	Status	Support
1	Support of UGS	6.2.5.1	o1	
2	Support of rtPS	6.2.5.2	o1	
3	Support of nrtPS	6.2.5.3	o1	
4	Support of BE	6.2.5.4	o1	
5	Refrain from issuing requests on UGS connections	6.2.5	c1	

o1: Must support at least one of these options
c1: IF Table A15/1 THEN m ELSE n/a

A.6.1.5 Bandwidth Allocation and Request Mechanism

This subclause covers the requirements of section 6.2.6 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A16—Bandwidth Allocation and Request Mechanism

Item	Capability	Reference	Status	Support
1	Request bandwidth via Bandwidth Request Header	6.2.6.1	m	
2	Request bandwidth via piggyback request	6.2.6.1	o	
3	Use aggregate bandwidth requests	6.2.6.1	m	
4	Use incremental bandwidth requests	6.2.6.1	o.1	
5	Transmit request during Request IE grant	6.2.6.1	m	
6	Transmit request during Data Grant IE grant	6.2.6.1	m	
7	GPC mode	6.2.6.2	x	
8	GPSS mode	6.2.6.3	m	
9	Respond to Unicast Polls	6.2.6.4.1	m	
10	Respond to Broadcasts Polls	6.2.6.4.2	c3	
11	Respond to Multicast Polls	6.2.6.4.2	c1	
12	Use Poll-me Bit	6.2.6.4.3	c2	

o.1: If Table A16/2 then m else o
c1: If Table A31/2 then m else n/a
c2: If Table A15/1 then m else n/a
c3: If Table A15/3 or Table A15/4 then m else o

A.6.1.6 MAC Support of PHY layers

This subclause covers the requirements of section 6.2.7 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A17—MAC Support of PHY Layers - SS

Item	Capability	Reference	Status	Support
1	Framed FDD	6.2.7.2	c1	
2	Full Duplex FDD	6.2.7.2	c2	
3	Half-Duplex FDD	6.2.7.2	c2	
4	TDD	6.2.7.3	c3	

o.1: Exactly one of these options must be supported
c1: If (profP1f or profP2f) then m else n/a
c2: If Table A17/1 then o.1 else n/a
c3: If (profP1t or profP2t) then m else n/a

Table A18—Map Relevance - SS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Minimum Map Relevance	6.2.7.6.1	m		200 us + round trip delay	
2	Maximum Map Relevance	6.2.7.6.1	m		c1	

c1: If (profP1f or profP2f) then 1 ms
else if (profP1t or profP2t) then 1 ms + TDD split

A.6.1.7 Contention resolution

This subclause covers the requirements of section 6.2.8 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A19—Contention resolution

Item	Capability	Reference	Status	Support
1	The SS supports truncated exponential backoff for initial ranging.	6.2.8	m	
2	The SS supports truncated exponential backoff for bandwidth request contention.	6.2.8	c1	

c1: If Table A16/10 or Table A16/11 then m else n/a

A.6.1.8 Network Entry and Initialization

This subclause covers the requirements of section 6.2.9 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A20—Network entry and Initialization

Item	Capability	Reference	Status	Support
1	Obtain Downlink Parameters	6.2.9.2	m	
2	Obtain Uplink Parameters	6.2.9.3, 6.2.9.4	m	
3	Initial Ranging	6.2.9.5, 6.2.9.6	m	
4	Negotiate Basic Capabilities	6.2.9.7	m	
5	SS Authorization	6.2.9.8, 7.2	m	
6	Registration	6.2.9.9	m	
7	Establish IP connectivity	6.2.9.10	m	
8	Establish ToD	6.2.9.11	m	
9	Transfer operational parameters	6.2.9.12	m	

A.6.1.8.1 Obtain Downlink Parameters

This subclause covers the requirements of section 6.2.9.2 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A21—Obtain Downlink Parameters

Item	Capability	Reference	Status	Support
1	SS receives DL-MAP correctly	6.2.9.2	m	
2	SS receives DCD correctly	6.2.9.2	m	

A.6.1.8.2 Obtain Uplink Parameters

This subclause covers the requirements of section 6.2.9.3 and 6.2.9.4 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A22—Obtain Uplink Parameters

Item	Capability	Reference	Status	Support
1	SS receives UCD correctly	6.2.9.3, 6.2.9.4	m	

A.6.1.8.3 Initial Ranging

This subclause covers the requirements of section 6.2.9.5 and 6.2.9.6 of IEEE Std 802.16-2001 (12/6/2001): "Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems".

Table A23—Initial Ranging

Item	Capability	Reference	Status	Support
1	SS receives UL-MAP with Initial Ranging slot(s)	6.2.9.5	m	
2	SS random access algorithm to select slot	6.2.9.5	m	
3	SS sends RNG-REQ in random slot within backoff window, using the correct burst profile	6.2.9.5	m	
4	SS receives RNG-RSP	6.2.9.5	m	
5	SS establishes Basic and Primary Management connections	6.2.9.5	m	
6	SS performs timing and power adjustment	6.2.9.6	m	
7	Use the RNG-REQ message to request a DL burst profile change	6.2.10.1	o	
8	SS performs network entry and initialization on DL Frequency Override channel, if instructed	6.2.9.6	m	

A.6.1.8.4 Negotiate Basic Capabilities

This subclause covers the requirements of section 6.2.9.7 of IEEE Std 802.16-2001 (12/6/2001): "Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems".

Table A24—Obtain Downlink Parameters

Item	Capability	Reference	Status	Support
1	SS sends SBC-REQ	6.2.9.7	m	
2	SS receives SBC-RSP	6.2.9.7	m	

A.6.1.8.5 SS Authorization

This subclause covers the requirements of section 6.2.9.8 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A25—SS Authorization

Item	Capability	Reference	Status	Support
1	SS sends Auth Request (PKM-REQ with *Code=4)*	6.2.9.8, 7.2	m	
2	SS receives Auth Reply (PKM-REQ with *Code=5)*	6.2.9.8, 7.2	m	
3	SS stores AK and derives KEK, HMAC_KEY_U and , HMAC_KEY_D	6.2.9.8, 7.2	m	
4	SS establishes SAs listed in Auth Reply	6.2.9.8, 7.2	m	

A.6.1.8.6 Registration

This subclause covers the requirements of section 6.2.9.9 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A26—Registration

Item	Capability	Reference	Status	Support
1	SS sends REG-REQ	6.2.9.9	m	
2	SS receives REG-RSP	6.2.9.9	m	
3	SS establishes Secondary Management Connection	6.2.9.9	m	
4	SS resends REG-REQ on timeout	6.2.9.9	m	

A.6.1.8.7 Establish IP Connectivity

This subclause covers the requirements of section 6.2.9.10 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A27—Establish IP Connectivity

Item	Capability	Reference	Status	Support
1	SS sends DHCPDISCOVER on Secondary Management Connection	6.2.9.10	m	
2	SS receives DHCPOFFER on Secondary Management Connection	6.2.9.10	m	
3	SS sends DHCPREQUEST on Secondary Management Connection	6.2.9.10	m	
4	SS receives DHCPACK on Secondary Management Connection	6.2.9.10	m	
5	SS establishes IP parameters	6.2.9.10	m	

A.6.1.8.8 Establish ToD

This subclause covers the requirements of section 6.2.9.11 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A28—Establish ToD

Item	Role	Reference	Status	Support
1	SS sends Time of Day request	6.2.9.11	m	
2	SS receives Time of Day response	6.2.9.11	m	
3	SS establishes Time of Day	6.2.9.11	m	

A.6.1.9 Periodic Ranging

This subclause covers the requirements of section 6.2.10 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A29—Periodic Ranging - SS

Item	Capability	Reference	Status	Support
1	Reinitialize after T4 with no periodic ranging opportunity	6.2.10	m	
2	Reinitialize after RNG-RSP with Ranging Status = re-range(4)	6.2.10	m	
3	Adjust PHY parameters in response to RNG-RSP after initial ranging	6.2.10	m	
4	Request change to more appropriate DL burst profile based upon thresholds in DCD.	6.2.10	m	
5	Use the RNG-REQ message to request a DL burst profile change in station maintenance interval.	6.2.10	m	
6	Use the DBPC-REQ message to request a DL burst profile change in data grant interval.	6.2.10	m	
7	Change DL burst profile based upon RNG-RSP.	6.2.10	m	
8	Change DL burst profile based upon DBPC-RSP	6.2.10	m	

A.6.1.10 Update of Channel descriptors

This subclause covers the requirements of section 6.2.11 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A30—Update of Channel descriptors - SS

Item	Capability	Reference	Status	Support
1	Support of two simultaneous sets of burst descriptors	6.2.11	m	
2	Store new uplink burst descriptors upon receiving UCD message with incremented Configuration change count	6.2.11	m	
3	Store new downlink burst descriptors upon receiving DCD message with incremented Configuration Change Count	6.2.11	m	
4	Transmit with new generation of burst descriptors after receiving UL-MAP with UCD Count matching the new Configuration Change Count	6.2.11	m	
5	Receive with new generation of burst descriptors after receiving DL-MAP with DCD Count matching the new Configuration Change Count	6.2.11	m	

A.6.1.11 Multicast Polling Groups

This subclause covers the requirements of section 6.2.12 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A31—Multicast Polling Groups - SS

Item	Capability	Reference	Status	Support
1	SS receives MCA-REQ	6.2.12	m	
2	SS supports participation in multicast polling group	6.2.12	o	
3	SS transmits MCA-RSP	6.2.12	m	

A.6.1.12 Quality of Service

This subclause covers the requirements of section 6.2.13 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.6.1.12.1 Dynamic Service Flow operations

Table A32—Dynamic Service Flow operations

Item	Role	Reference	Status	Support
1	Creation - BS Initiated	6.2.13	m	
2	Creation - SS initiated	6.2.13	c1	
3	Change – BS Initiated	6.2.13	m	
4	Change – SS Initiated	6.2.13	c1	
5	Deletion – BS Initiated	6.2.13	m	
6	Deletion – SS Initiated	6.2.13	c1	

c1: if (profM1 && A3/5) then m else x // only for SVCs and soft-PVCs

A.6.1.12.2 SS Initiated Dynamic Service Flow creation

Table A33—SS Initiated Service Flow creation

Prerequisite: A32/2

Item	Role	Reference	Status	Support
1	SS sends DSA-REQ	6.2.13	x	
2	SS receives DSX-RVD	6.2.13	x	
3	SS receives DSA-RSP	6.2.13	x	
4	SS sends DSA-ACK	6.2.13	x	

A.6.1.12.3 BS Initiated Service Flow Creation

Table A34—BS Initiated Service Flow Creation

Item	Role	Reference	Status	Support
1	SS receives DSA-REQ	6.2.13	m	
2	SS sends DSA-RSP	6.2.13	m	
3	SS receives DSA-ACK	6.2.13	m	

A.6.1.12.4 SS Initiated Dynamic Service Flow Change

Table A35—SS Initiated Service Flow change

Prerequisite: A32/4

Item	Role	Reference	Status	Support
1	SS sends DSC-EQ	6.2.13	x	
2	SS receives DSX-RVD	6.2.13	x	
3	SS receives DSC-RSP	6.2.13	x	
4	SS sends DSC-ACK	6.2.13	x	

A.6.1.12.5 BS Initiated Service Flow Change

Table A36—BS Initiated SF Change

Item	Role	Reference	Status	Support
1	SS receives DSC-REQ	6.2.13	m	
2	SS sends DSC-RSP	6.2.13	m	
3	SS receives DSC-ACK	6.2.13	m	

A.6.1.12.6 SS Initiated Service Flow Deletion

Table A37—BS Initiated SF Deletion

Prerequisite: A32/6

Item	Role	Reference	Status	Support
1	SS sends DSD-REQ	6.2.13	x	
2	SS receives DSD-RSP	6.2.13	x	

A.6.1.12.7 BS Initiated Service Flow Deletion

Table A38—BS Initiated SF Change

Item	Role	Reference	Status	Support
1	SS receives DSD-REQ	6.2.13	m	
2	SS sends DSD-RSP	6.2.13	m	

A.6.1.13 SS PKM functions

This subclause covers the requirements of section 7 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A39—PKM functions

Item	Capability	Reference	Status	Support
1	SS supports Authorization	7	m	
2	SS supports AK exchange	7	m	
3	SS supports TEK exchange	7	m	
4	SS support user data encryption	7	m	
5	SS supports PKM message authentication	7	m	
6	SS supports MAC management message authentication	7	m	
7	SS supports Primary SA	7	m	
8	SS supports Static SAs	7	o	
9	SS supports Dynamic SAs	7	o	
10	SS supports dynamic SA mapping	7	c1	
11	Encryption	6.2.3.6	m	
12	Decryption	6.2.3.6	m	

c1 : IF Table A39/9 then m else n/a

Table A40—SS Encryption and authentication Algorithms

Item	Capability	Reference	Status	Support
1	DES data encryption/decryption	7	m	
2	3DES KEK decryption	7	m	
3	RSA decryption with 1024 bit key	7	m	
4	HMAC with SHA-1	7	m	
5	SA with no encryption/decryption as encryption algorithm	7	m	

A.6.1.14 Configuration File

This subclause covers the requirements of sections 6.2.9.12 and 9 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A41—DHCP and Configuration File

Item	Capability	Reference	Status	Support
1	Tx TFT-CPLT	6.2.9.12	m	
2	Rx TFTP-RSP	6.2.9.12	m	
3	Transfer Config File	6.2.9.12	m	
4	Support Configuration File format	9	m	
5	SS MIC Configuration setting	9	m	
6	End Configuration Setting	9	m	
7	Software Upgrade Filename	9	m	
8	SNMP Write Access Control	9	m	
9	SNMP MIB Object	9	m	
10	Software Server IP Address	9	m	
11	Pad Configuration setting	9	m	
12	Vendor specific configuration settings	9	o	

A.6.2 MAC PDU descriptions, seen from the SS

This subclause covers the requirements of the various PDU formats.

A.6.2.1 Headers and Subheaders

Table A42—Headers and Subheaders – SS

Item	Capability	Reference	Status	Support
1	Support Generic MAC Header – Tx	6.2.2.1.1	m	

Table A42—Headers and Subheaders – SS

2	Support Generic MAC Header – Rx	6.2.2.1.1	m	
3	Support of Bandwidth Request Header – Tx	6.2.2.1.2	m	
4	Support of Bandwidth Request Header – Rx	6.2.2.1.2	N/a	
5	Support Fragmentation sub-header –Tx	6.2.2.2.1	m	
6	Support Fragmentation sub-header – Rx	6.2.2.2.1	m	
7	Grant Management Subheader for UGS – Tx	6.2.2.2.2	c1	
8	Grant Management Subheader for non-UGS – Tx	6.2.2.2.2	c2	
9	Grant Management Subheader – Rx	6.2.2.2.2	N/a	
10	Packing Subheader – Tx	6.2.2.2.3	c3	
11	Packing Subheader – Rx	6.2.2.2.3	m	

c1: If Table A15/1 then m else n/a
c2: If Table A16/2 then m else n/a
c3: If Table A13/3 then m else n/a

A.6.2.2 MAC Management PDUs

This section defines the requirements for the structure of PDUs and Management messages. The requirement to receive a PDU or its parameters does not imply a requirement to act upon the PDU or parameter.

A.6.2.2.1 UCD message

Table A43—UCD Message

Item	Capability	Reference	Status	Support
1	UCD - Rx	6.2.2.3.3	m	
2	UCD - Tx	6.2.2.3.3	x	
3	Burst Descriptor - Rx	11.1.1.1	m	
4	Symbol Rate -Rx	11.1.1.1	n/a	
5	Frequency - Rx	11.1.1.1	n/a	
6	SS Transition Gap - Rx	11.1.1.1	c1	
7	Roll off factor - Rx	11.1.1.1	n/a	
8	Power Adjustment Rule	11.1.1.1	m	
9	Contention Based Reservation Time-out	11.1.1.1	m	

c1: if (present) then m else Table A125/12

Table A44—UL Burst Profile Encodings

Item	Capability	Reference	Status	Support
1	Modulation Type-Rx	11.1.1.2	m	
2	Preamble Length-Rx	11.1.1.2	m	
3	FEC Code Type-Rx	11.1.1.2	m	
4	RS Information Bytes-Rx	11.1.1.2	m	
5	RS parity bytes-Rx	11.1.1.2	m	
6	BCC Code Type-Rx	11.1.1.2	n/a	
7	BTC Row Code Type-Rx	11.1.1.2	n/a	
8	BTC Column Type-Rx	11.1.1.2	n/a	
9	BTC Interleaving Type-Rx	11.1.1.2	n/a	
10	Scrambler Seed-Rx	11.1.1.2	m	
11	Last Codeword Length-Rx	11.1.1.2	m	

A.6.2.2.2 DCD message

Table A45—DCD Message

Item	Capability	Reference	Status	Support
1	DCD - Rx	6.2.2.3.1	m	
2	DCD – Tx	6.2.2.3.1	x	
3	Burst Descriptor - Rx	11.1.2.1	m	
4	BS Transmit Power - Rx	11.1.2.1	m	
5	Frame Duration - Rx	11.1.2.1	n/a	
6	DL PHY Type – Rx	11.1.2.1	m	
7	Power Adjustment Rule - Rx	11.1.2.1	m	

Table A46—DL Burst Profile Encodings

Item	Capability	Reference	Status	Support
1	Modulation Type-Rx	11.1.2.2	m	
2	FEC Code Type-Rx	11.1.2.2	m	
3	RS Information Bytes-Rx	11.1.2.2	m	
4	RS parity bytes-Rx	11.1.2.2	m	
5	BCC Code Type-Rx	11.1.2.2	m	
6	BTC Code Type-Rx	11.1.2.2	m	
7	BTC Row Code Type-Rx	11.1.2.2	m	
8	BTC Column Type-Rx	11.1.2.2	m	
9	BTC Interleaving Type-Rx	11.1.2.2	m	
10	Last Codeword Length-Rx	11.1.2.2	m	
11	DIUC Mandatory exit Threshold-Rx	11.1.2.2	m	
12	DIUC minimum entry Threshold-Rx	11.1.2.2	m	
13	Preamble present-Rx	11.1.2.2	m	

A.6.2.2.3 DL-MAP

Table A47—DL-MAP Message

Item	Capability	Reference	Status	Support
1	DL-MAP – Rx	6.2.2.3.2	m	
2	DL-MAP – Tx	6.2.2.3.2	x	

A.6.2.2.4 UL-MAP

Table A48—UL-MAP Message

Item	Capability	Reference	Status	Support
1	UL-MAP – Rx	6.2.2.3.4	m	
2	UL-MAP – Tx	6.2.2.3.4	x	

A.6.2.2.5 RNG-REQ

Table A49—RNG-REQ Message

Item	Capability	Reference	Status	Support
1	RNG-REQ – Rx	6.2.2.3.5	N/a	
2	RNG-REQ – Tx	6.2.2.3.5	m	
3	Requested DL Burst Type – Tx	11.1.3	m	
4	SS MAC Address – Tx	11.1.3	m	
5	Ranging Anomalies	11.1.3	m	

A.6.2.2.6 RNG-RSP

Table A50—RNG-RSP Message

Item	Capability	Reference	Status	Support
1	RNG-RSP – Rx	6.2.2.3.6	m	
2	RNG-RSP – Tx	6.2.2.3.6	x	
3	Timing Adjust Information – Rx	11.1.4	m	
4	Power Adjust Information – Rx	11.1.4	m	
5	Frequency Adjust Information – Rx	11.1.4	n/a	
6	Ranging Status – Rx	11.1.4	m	
7	DL Frequency Override – Rx	11.1.4	m	
8	UL Channel ID Override – Rx	11.1.4	n/a	
9	DL Operational Burst Profile – Rx	11.1.4	m	
10	Basic CID –Rx	11.1.4	m	
11	Primary Management CID –Rx	11.1.4	m	
12	SS MAC Address – Rx	11.1.4	m	

A.6.2.2.7 REG-REQ

Table A51—REG-REQ Message

Item	Capability	Reference	Status	Support
1	REG-REQ – Rx	6.2.2.3.7	N/a	
2	REG-REQ – Tx	6.2.2.3.7	m	
3	HMAC Digest – Tx	11.2.6	m	
4	Vendor ID Encoding – Tx	11.4.3	o	
5	UL CID Support –Tx	11.4.1.1	m	
6	PKM Flow Control –Tx	11.4.1.3	o	
7	DSx Flow Control – Tx	11.4.1.4	o	
8	MCA Flow Control – Tx	11.4.1.5	o	
9	IP Version – Tx	11.4.1.7	o	
10	MAC CRC Support – Tx	11.4.1.8	o	

A.6.2.2.8 REG-RSP

Table A52—REG-RSP Message

Item	Capability	Reference	Status	Support
1	REG-RSP – Rx	6.2.2.3.8	m	
2	REG-RSP – Tx	6.2.2.3.8	x	
3	MAC Version – Rx	11.4.4	m	
4	Secondary Management CID	TBD	m	
5	HMAC Digest – Rx	11.2.6	m	
6	UL CID Support –Rx	11.4.1.1	m	
7	PKM Flow Control –Rx	11.4.1.3	m	
8	DSx Flow Control – Rx	11.4.1.4	m	
9	MCA Flow Control – Rx	11.4.1.5	m	
10	IP Version – Rx	11.4.1.7	m	
11	MAC CRC Support – Rx	11.4.1.8	m	
12	Vendor ID Encoding – Rx	11.4.3	m	
13	Vendor-specific Extensions – Rx	11.4.11	c1	

c1: if (Table A51/4) then m else n/a

A.6.2.2.9 PKM-REG/RSP

A.6.2.2.9.1 Security Association Add parameters

Table A53—Security Association Add parameters

Item	Capability	Reference	Status	Support
1	Key Sequence Number –Rx	11.2.5	m	
2	SA Descriptors – Rx	11.2.17	m	

A.6.2.2.9.2 Auth Request parameters

Table A54—Auth Request parameters

Item	Capability	Reference	Status	Support
1	SS-Certificate –Tx	11.2.12	m	
2	Security Capabilities – Tx	11.2.13	m	

A.6.2.2.9.3 Auth Reply parameters

Table A55—Auth Request parameters

Item	Capability	Reference	Status	Support
1	AUTH-Key –Rx	11.2.2	m	
2	Key-Lifetime – Rx	11.2.4	m	
3	Key-Sequence-Number – Rx	11.2.5	m	
4	SA Descriptor – Rx	11.2.17	m	

A.6.2.2.9.4 Auth Reject parameters

Table A56—Auth Reject parameters

Item	Capability	Reference	Status	Support
1	Error code – Rx	11.2.10	m	
2	Display-String – Rx	11.2.1	o	

A.6.2.2.9.5 Key Request parameters

Table A57—Key Request parameters

Item	Capability	Reference	Status	Support
1	Key-Sequence-Number – Tx	11.2.5	m	
2	SAID – Tx	11.2.7	m	
3	HMAC-Digest – Tx	11.2.6	m	

A.6.2.2.9.6 Key Reply parameters

Table A58—Auth Reject parameters

Item	Capability	Reference	Status	Support
1	Key-Sequence-number – Rx	11.2.5	m	
2	SAID – Rx	11.2.7	m	
3	TEK-Parameters – Rx	11.2.8	m	
4	HMAC-Digest – Rx	11.2.6	m	

A.6.2.2.9.7 Key Reject parameters

Table A59—Key Reject parameters

Item	Capability	Reference	Status	Support
1	Key Sequence Number –Rx	11.2.5	m	
2	SAID – Rx	11.2.7	m	
3	Error-Code – Rx	11.2.10	m	
4	HMAC-Digest – Rx	11.2.6	m	

A.6.2.2.9.8 Authorization Invalid parameters

Table A60—Authorization Invalid parameters

Item	Capability	Reference	Status	Support
1	Error-Code – Rx	11.2.10	m	
2	Display-String – Rx	11.2.1	m	

A.6.2.2.9.9 TEK Invalid parameters

Table A61—TEK Invalid parameters

Item	Capability	Reference	Status	Support
1	Key-Sequence-number –Rx	11.2.5	m	
2	SAID – Rx	11.2.7	m	
3	Error-Code – Rx	11.2.10	m	
4	Display-String – Rx	11.2.1	m	
5	HMAC-Digest – Rx	11.2.6	m	

A.6.2.2.9.10 Authentication Information parameters

Table A62—Authentication Information parameters

Item	Capability	Reference	Status	Support
1	CA-Certificate – Tx	11.2.11	o	

A.6.2.2.10 DSA-REQ

Table A63—DSA-REQ Message

Item	Capability	Reference	Status	Support
1	DSA-REQ – Rx	6.2.2.3.10	m	
2	DSA-REQ – Tx	6.2.2.3.10	c1	
3	Service Flow ID – Rx	11.4.8.1	m	
4	Transport CID – Rx	11.4.8.2	m	
5	Service class name – Rx	11.4.8.3	n/a	
6	Service Flow Error Encodings – Rx	11.4.8.4	n/a	
7	Errored Parameter – Rx	11.4.8.4	n/a	
8	Error Code – Rx	11.4.8.4	n/a	
9	Error Message – Rx	11.4.8.4	n/a	
10	QoS Parameter Set Type – Rx	11.4.8.5	m	
11	Traffic Priority – Rx	11.4.8.6	c2	
12	Maximum Sustained Traffic Rate – Rx	11.4.8.7	m	
13	Maximum Traffic Burst –Rx	11.4.8.8	m	
14	Minimum Reserved Traffic Rate – Rx	11.4.8.9	m	
15	Vendor Specific QoS Parameters – Rx	11.4.8.10	c3	
16	Service Flow Scheduling Type – Rx	11.4.8.11	m	
17	Request/Transmission Policy – Rx	11.4.8.12	m	
18	Tolerated Jitter – Rx	11.4.8.13	m	
19	Maximum Latency – Rx	11.4.8.14	m	
20	Fixed vs. Variable Length SDU Indicator –Rx	11.4.8.15	m	
21	SDU Size – Rx	11.4.8.16	c4	
22	Target SAID – Rx	11.4.8.17	m	
23	HMAC Tuple –Rx	11.4.10	m	
24	Vendor Specific Information – Rx	11.4.11	c3	
25	Convergence Sublayer Specification	11.4.9.1	m	

c1: if (profM1 && Table A3/5) then m else x // only for SVCs and soft-PVCs
c2: if (Service Flow Scheduling Type = BE) then// only for best effort services
Rx = m; Use = o
else n/a
c3: if (Table A51/4) then m else n/a
c4: if (profM1) then m else n/a

Table A64—DSA-REQ Message Packet CL Parameters

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	Packet Classification Rule – Rx	11.4.9.3	m	
2	Classifier Rule Priority – Rx	11.4.9.3	m	
3	IP Type of Service/DSCP – Rx	11.4.9.3	c1	
4	Protocol – Rx	11.4.9.3	c1	
5	IP Masked Source Address – Rx	11.4.9.3	c1	
6	IP Destination Address – Rx	11.4.9.3	c1	
7	Protocol Source Port Range – Rx	11.4.9.3	c1	
8	Protocol destination Port Range – Rx	11.4.9.3	c1	
9	Ethernet Destination MAC Address – Rx	11.4.9.3	c2	
10	Ethernet Source MAC Address – Rx	11.4.9.3	c2	
11	Ethertype/IEEE 802.2 SAP – Rx	11.4.9.3	c2	
12	IEEE 802.1D User_Priority – Rx	11.4.9.3	c3	
13	IEEE 802.1Q VLAN_ID – Rx	11.4.9.3	c3	
14	Associated Payload Header Suppression Index – Rx	11.4.9.3	c4	
15	Vendor Specific Classifier Parameters – Rx	11.4.9.3	c5	
16	Payload Header Suppression Rule – Rx	11.4.9.3	c4	
17	Payload Header Suppression Index – Rx	11.4.9.3	c4	
18	Payload Header Suppression Field – Rx	11.4.9.3	c4	
19	Payload Header Suppression Mask – Rx	11.4.9.3	c4	
20	Payload Header Suppression Size – Rx	11.4.9.3	c4	
21	Payload Header Suppression Verification – Rx	11.4.9.3	c4	
22	Vendor Specific PHS Parameters – Rx	11.4.9.3	c6	

c1: m for IPV4 services, if Table A5/4 then m for IPV6 services // IP
c2: If Table A5/5 then m else n/a // Ethernet
c3: If Table A5/6 then m else n/a // VLAN
c4: If Table A5/7 then m else n/a // PHS
c5: If Table A51/4 then o else n/a // Vendor ID
c6: If Table A5/7 and REG-REQ Message/4 then o else n/a// PHS & Vendor ID

Table A65—DSA-REQ Message ATM CL Parameters

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VPI – Rx	11.4.9.4	m	
2	VCI – Rx	11.4.9.4	m	
3	ATM switching – Rx	11.4.9.4	m	

A.6.2.2.11 DSA-RSP

Table A66—DSA-RSP Message

Item	Capability	Reference	Status	Support
1	DSA-RSP – Rx	6.2.2.3.11	c1	
2	DSA-RSP – Tx	6.2.2.3.11	m	
3	Service Flow ID – Tx	11.4.8.1	x	
4	Transport CID – Tx	11.4.8.2	x	
5	Service class name – Tx	11.4.8.3	x	
6	Service Flow Error Encodings – Tx	11.4.8.4	m	
7	Errored Parameter – Tx	11.4.8.4	m	
8	Error Code – Tx	11.4.8.4	m	
9	Error Message – Tx	11.4.8.4	o	
10	QoS Parameter Set Type – Tx	11.4.8.5	x	
11	Traffic Priority – Tx	11.4.8.6	x	
12	Maximum Sustained Traffic Rate – Tx	11.4.8.7	x	
13	Maximum Traffic Burst – Tx	11.4.8.8	x	
14	Minimum Reserved Traffic Rate – Tx	11.4.8.9	x	
15	Vendor Specific QoS Parameters – Tx	11.4.8.10	x	

Table A66—DSA-RSP Message

16	Service Flow Scheduling Type – Tx	11.4.8.11	x	
17	Request/Transmission Policy – Tx	11.4.8.12	x	
18	Tolerated Jitter – Tx	11.4.8.13	x	
19	Maximum Latency – Tx	11.4.8.14	x	
20	Fixed vs. Variable Length SDU Indicator – Tx	11.4.8.15	x	
21	SDU Size – Tx	11.4.8.16	x	
22	Target SAID – Tx	11.4.8.17	x	
23	HMAC Tuple –Tx	11.4.10	m	
24	Vendor Specific Information – Tx	11.4.11	x	
25	Convergence Sublayer Specification - Tx	11.4.9.1	x	

c1: if (profM1 && Table A3/5) then m else x // only for SVCs and soft-PVCs

Table A67—DSA-RSP Message Packet CL Parameters

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	Classifier Error Parameter Set – Tx	11.4.9.3	m	
2	Errored parameter (classifier) – Tx	11.4.9.3	m	
3	Error Code (classifier) – Tx	11.4.9.3	m	
4	Error Message (classifier) – Tx	11.4.9.3	o	
5	PHS Error Parameter Set – Tx	11.4.9.3	m	
6	Errored parameter (PHS) – Tx	11.4.9.3	c1	
7	Error Code (PHS) – Tx	11.4.9.3	m	
8	Error Message (PHS) – Tx	11.4.9.3	c2	

c1: If Table A5/7 then m else n/a // PHS
c2: If Table A5/7 then o else n/a // PHS

Table A68—DSA-RSP Message ATM CL Parameters

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VPI – Tx	11.4.9.4	x	
2	VCI – Tx	11.4.9.4	x	
3	ATM Switching - Tx	11.4.9.4	x	

A.6.2.2.12 DSA-ACK

Table A69—DSA-ACK Message

Item	Capability	Reference	Status	Support
1	DSA-ACK – Rx	6.2.2.3.12	m	
2	DSA-ACK – Tx	6.2.2.3.12	c1	
6	Service Flow Error Encodings – Rx	11.4.8.4	n/a	
7	Errored Parameter – Rx	11.4.8.4	n/a	
8	Error Code – Rx	11.4.8.4	n/a	
9	Error Message – Rx	11.4.8.4	n/a	
23	HMAC Tuple –Rx	11.4.10	m	

c1: if (profM1 && Table A3/5) then m else x // only for SVCs and soft-PVCs

A.6.2.2.13 DSC-REQ

Table A70—DSC-REQ Message

Item	Capability	Reference	Status	Support
1	DSC-REQ – Rx	6.2.2.3.13	m	
2	DSC-REQ – Tx	6.2.2.3.13	c1	
3	Service Flow ID – Rx	11.4.8.1	m	
4	Transport CID – Rx	11.4.8.2	m	
5	Service class name – Rx	11.4.8.3	n/a	
6	Service Flow Error Encodings – Rx	11.4.8.4	n/a	
7	Errored Parameter – Rx	11.4.8.4	n/a	
8	Error Code – Rx	11.4.8.4	n/a	
9	Error Message – Rx	11.4.8.4	n/a	
10	QoS Parameter Set Type – Rx	11.4.8.5	m	
11	Traffic Priority – Rx	11.4.8.6	c2	
12	Maximum Sustained Traffic Rate – Rx	11.4.8.7	m	
13	Maximum Traffic Burst –Rx	11.4.8.8	m	
14	Minimum Reserved Traffic Rate – Rx	11.4.8.9	m	
15	Vendor Specific QoS Parameters – Rx	11.4.8.10	c3	
16	Service Flow Scheduling Type – Rx	11.4.8.11	m	
17	Request/Transmission Policy – Rx	11.4.8.12	n/a	
18	Tolerated Jitter – Rx	11.4.8.13	m	
19	Maximum Latency – Rx	11.4.8.14	m	
20	Fixed vs. Variable Length SDU Indicator –Rx	11.4.8.15	n/a	
21	SDU Size – Rx	11.4.8.16	n/a	
22	Target SAID – Rx	11.4.8.17	m	
23	HMAC Tuple –Rx	11.4.10	m	
24	Vendor Specific Information – Rx	11.4.11	c3	
25	Convergence Sublayer Specification – Rx	11.4.9.1	n/a	

c1: if (profM1 && Table A3/5) then m else x // only for SVCs and soft-PVCs
c2: if (Service Flow Scheduling Type = BE) then// only for best effort services
Rx = m; Use = o
else n/a
c3: if (REG-REQ Message/4) then m else n/a

Table A71—DSC-REQ Message Packet CL Parameters

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	Classifier Change Action - Rx	11.4.9.3	m	
2	Packet Classification Rule – Rx	11.4.9.3	m	
3	Classifier Rule Priority – Rx	11.4.9.3	m	
4	IP Type of Service/DSCP – Rx	11.4.9.3	c1	
5	Protocol – Rx	11.4.9.3	c1	
6	IP Masked Source Address – Rx	11.4.9.3	c1	
7	IP Destination Address – Rx	11.4.9.3	c1	
8	Protocol Source Port Range – Rx	11.4.9.3	c1	
9	Protocol destination Port Range – Rx	11.4.9.3	c1	
10	Ethernet Destination MAC Address – Rx	11.4.9.3	c2	
11	Ethernet Source MAC Address – Rx	11.4.9.3	c2	
12	Ethertype/IEEE 802.2 SAP – Rx	11.4.9.3	c2	
13	IEEE 802.1D User_Priority – Rx	11.4.9.3	c3	
14	IEEE 802.1Q VLAN_ID – Rx	11.4.9.3	c3	
15	Associated Payload Header Suppression Index – Rx	11.4.9.3	c4	
16	Vendor Specific Classifier Parameters – Rx	11.4.9.3	c5	
17	PHS Change Action - Rx	11.4.9.3	c4	
18	Payload Header Suppression Rule – Rx	11.4.9.3	c4	
19	Payload Header Suppression Index – Rx	11.4.9.3	c4	
20	Payload Header Suppression Field – Rx	11.4.9.3	c4	
21	Payload Header Suppression Mask – Rx	11.4.9.3	c4	
22	Payload Header Suppression Size – Rx	11.4.9.3	c4	
23	Payload Header Suppression Verification – Rx	11.4.9.3	c4	
24	Vendor Specific PHS Parameters – Rx	11.4.9.3	c6	
25	Dynamic Service Change Action (Classifier) – Rx	11.4.9.3	m	
26	Dynamic Service Change Action (PHS Rules) – Rx	11.4.9.3	c4	

c1: m for IPV4 services, if Table A5/4 then m for IPV6 services // IP
c2: If Table A5/5 then m else n/a // Ethernet
c3: If Table A5/6 then m else n/a // VLAN

c4: If Table A5/7 then m else n/a // PHS
c5: If Table A51/4 then o else n/a // Vendor ID
c6: If Table A5/7 and Table A51/4 then o else n/a// PHS & Vendor ID

Table A72—DSC-REQ Message ATM CL Parameters

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VPI – Rx	11.4.9.4	m	
2	VCI – Rx	11.4.9.4	m	
3	ATM Switching – Rx	11.4.9.4	n/a	

A.6.2.2.14 DSC-RSP

Table A73—DSC-RSP Message

Item	Capability	Reference	Status	Support
1	DSC-RSP – Rx	6.2.2.3.14	c1	
2	DSC-RSP – Tx	6.2.2.3.14	m	
3	Service Flow ID – Tx	11.4.8.1	x	
4	Transport CID – Tx	11.4.8.2	x	
5	Service class name – Tx	11.4.8.3	x	
6	Service Flow Error Encodings – Tx	11.4.8.4	m	
7	Errored Parameter – Tx	11.4.8.4	m	
8	Error Code – Tx	11.4.8.4	m	
9	Error Message – Tx	11.4.8.4	o	
10	QoS Parameter Set Type – Tx	11.4.8.5	x	
11	Traffic Priority – Tx	11.4.8.6	x	
12	Maximum Sustained Traffic Rate – Tx	11.4.8.7	x	
13	Maximum Traffic Burst – Tx	11.4.8.8	x	
14	Minimum Reserved Traffic Rate – Tx	11.4.8.9	x	
15	Vendor Specific QoS Parameters – Tx	11.4.8.10	x	

Table A73—DSC-RSP Message

16	Service Flow Scheduling Type – Tx	11.4.8.11	x	
17	Request/Transmission Policy – Tx	11.4.8.12	x	
18	Tolerated Jitter – Tx	11.4.8.13	x	
19	Maximum Latency – Tx	11.4.8.14	x	
20	Fixed vs. Variable Length SDU Indicator – Tx	11.4.8.15	x	
21	SDU Size – Tx	11.4.8.16	x	
22	Target SAID – Tx	11.4.8.17	x	
23	HMAC Tuple –Tx	11.4.10	m	
24	Vendor Specific Information – Tx	11.4.11	x	
25	Convergence Sublayer Specification – Tx	11.4.9.1	x	

c1: if (profM1 && Table A3/5) then m else x // only for SVCs and soft-PVCs

Table A74—DSC-RSP Message Packet CL Parameters

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	Classifier Error Parameter Set – Tx	11.4.9.3	m	
2	Errored parameter (classifier) – Tx	11.4.9.3	m	
3	Error Code (classifier) – Tx	11.4.9.3	m	
4	Error Message (classifier) – Tx	11.4.9.3	o	
5	PHS Error Parameter Set – Tx	11.4.9.3	m	
6	Errored parameter (PHS) – Tx	11.4.9.3	c1	
7	Error Code (PHS) – Tx	11.4.9.3	m	
8	Error Message (PHS) – Tx	11.4.9.3	c2	

c1: If Table A5/7 then m else n/a // PHS
c2: If Table A5/7 then o else n/a // PHS

Table A75—DSC-RSP Message ATM CL Parameters

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VPI – Tx	11.4.9.4	x	
2	VCI – Tx	11.4.9.4	x	
3	ATM Switching – Tx	11.4.9.4	x	

A.6.2.2.15 DSC-ACK

Table A76—DSC-ACK Message

Item	Capability	Reference	Status	Support
1	DSC-ACK – Rx	6.2.2.3.15	m	
2	DSC-ACK – Tx	6.2.2.3.15	c1	
6	Service Flow Error Encodings – Rx	11.4.8.4	n/a	
7	Errored Parameter – Rx	11.4.8.4	n/a	
8	Error Code – Rx	11.4.8.4	n/a	
9	Error Message – Rx	11.4.8.4	n/a	
23	HMAC Tuple –Rx	11.4.10	m	

c1: if (profM1 && Table A3/5) then m else x // only for SVCs and soft-PVCs

A.6.2.2.16 DSD-REQ

Table A77—DSD-REQ Message

Item	Capability	Reference	Status	Support
1	DSD-REQ – Rx	6.2.2.3.16	m	
2	DSD-REQ – Tx	6.2.2.3.16	c1	
3	HMAC Tuple – Rx	11.4.10	m	

c1: if (profM1 && Table A3/5) then m else x // only for SVCs and soft-PVCs

A.6.2.2.17 DSD-RSP

Table A78—DSD-RSP Message

Item	Capability	Reference	Status	Support
1	DSD-RSP – Rx	6.2.2.3.17	c1	
2	DSD-RSP – Tx	6.2.2.3.17	m	
3	HMAC Tuple – Tx	11.4.10	m	

c1: if (profM1 && Table A3/5) then m else x // only for SVCs and soft-PVCs

A.6.2.2.18 MCA-REQ

Table A79—MCA-REQ Message

Item	Capability	Reference	Status	Support
1	MCA-REQ – Rx	6.2.2.3.18	m	
2	MCA-REQ – Tx	6.2.2.3.18	x	
3	Multicast CID – Rx	11.1.5	m	
4	Assignment –Rx	11.1.5	m	

A.6.2.2.19 MCA-RSP

Table A80—MCA-RSP Message

Item	Capability	Reference	Status	Support
1	MCA-RSP – Rx	6.2.2.3.19	n/a	
2	MCA-RSP – Tx	6.2.2.3.19	m	

A.6.2.2.20 DBPC-REQ

Table A81—DBPC-REQ Message

Item	Capability	Reference	Status	Support
1	DBPC-REQ – Rx	6.2.2.3.20	n/a	
2	DBPC-REQ – Tx	6.2.2.3.20	m	

A.6.2.2.21 DBPC-RSP

Table A82—DBPC-RSP Message

Item	Capability	Reference	Status	Support
1	DBPC-RSP – Rx	6.2.2.3.21	m	
2	DBPC-RSP – Tx	6.2.2.3.21	x	

A.6.2.2.22 RES-CMD

Table A83—RES-CMD Message

Item	Capability	Reference	Status	Support
1	RES-CMD – Rx	6.2.2.3.22	m	
2	RES-CMD – Tx	6.2.2.3.22	x	
3	HMAC Tuple – Rx	11.4.10	m	

A.6.2.2.23 SBC-REQ

Table A84—SBC-REQ Message

Item	Capability	Reference	Status	Support
1	SBC-REQ – Rx	6.2.2.3.23	n/a	
2	SBC-REQ – Tx	6.2.2.3.23	m	
3	10-66 GHz PHY SS Demod Support – Tx	11.4.1.2	m	
4	10-66 GHz PHY SS Modulator Support – Tx	11.4.1.2	m	
5	10-66 GHz PHY SS DL FEC Types – Tx	11.4.1.2	m	
6	10-66 GHz PHY SS UL FEC Types – Tx	11.4.1.2	m	
7	BW Allocation Support – Tx	11.4.1.6	m	

A.6.2.2.24 SBC-RSP

Table A85—SBC-RSP Message

Item	Capability	Reference	Status	Support
1	SBC-RSP – Rx	6.2.2.3.24	m	
2	SBC-RSP – Tx	6.2.2.3.24	x	
3	10-66 GHz PHY SS Demod Support – Rx	11.4.1.2	m	
4	10-66 GHz PHY SS Modulator Support – Rx	11.4.1.2	m	
5	10-66 GHz PHY SS DL FEC Types – Rx	11.4.1.2	m	
6	10-66 GHz PHY SS UL FEC Types – Rx	11.4.1.2	m	
7	BW Allocation Support – Rx	11.4.1.6	m	

A.6.2.2.25 CLK-CMP

Table A86—CLK-CMP Message

Item	Capability	Reference	Status	Support
1	CLK-CMP – Rx	6.2.2.3.25	m	
2	CLK-CMP – Tx	6.2.2.3.25	x	
3	Support of Services requiring network clock reconstruction		o	

Note: The SS need only process this message if it supports services that require reconstruction of the network clock (e.g., E1/T1)

A.6.2.2.26 DREG-CMD

Table A87—DREG-CMD Message

Item	Capability	Reference	Status	Support
1	DREG-CMD – Rx	6.2.2.3.26	m	
2	DREG-CMD – Tx	6.2.2.3.26	x	
3	HMAC Tuple – Rx	11.4.10	m	

A.6.2.2.27 DSX-RVD

Table A88—DSX-RVD Message

Item	Capability	Reference	Status	Support
1	DSX-RVD – Rx	6.2.2.3.27	m	
2	DSX-RVD – Tx	6.2.2.3.27	x	

A.6.2.2.28 TFTP-CPLT

Table A89—TFTP-CLPT Message

Item	Capability	Reference	Status	Support
1	TFTP-CPLT – Rx	6.2.2.3.28	n/a	
2	TFTP-CPLT – Tx	6.2.2.3.28	m	
3	HMAC Tuple – Tx	11.4.10	m	

A.6.2.2.29 TFTP-RSP

Table A90—TFTP-RSP Message

Item	Capability	Reference	Status	Support
1	TFTP-RSP – Rx	6.2.2.3.29	m	
2	TFTP-RSP – Tx	6.2.2.3.29	x	

A.6.2.3 ATM CS PDUs

Table A91—ATM CS PDUs

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	CS PDU for ATM connections with no PHS	5.1.2.1	m	
2	CS PDU for VP-switched ATM connections with PHS	5.1.2.1 & 5.1.2.3	m	
3	CS PDU for VC-switched ATM connections with PHS	5.1.2.1 & 5.1.2.3	m	

A.6.2.4 Packet CS PDUs

Table A92—Packet CS PDUs

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	PDU on transport connection	5.2.1	m	

A.6.3 PDU parameters

This subclause covers the requirements of section 10 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.6.3.1 Parameters and Constants

This subclause covers the requirements of section 10 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.6.3.1.1 Global Values

Table A93—SS Global Parameters Remote Support

Item	Capability	Reference	Status	Support
1	Accommodate DCD Interval in range 10 ms to 10 s	10.1	m	
2	Accommodate UCD Interval in range 10 ms to 10 s	10.1	m	
3	Accommodate UCD transition >= 2 ms	10.1	m	
4	Accommodate DCD transition >= 2 ms	10.1	m	

Table A93—SS Global Parameters Remote Support

5	Accommodate Max Map Pending <= 4096 minislots beyond the allocation start time	10.1	c1	
6	Accommodate Initial Ranging Interval <= 2 s	10.1	m	
7	Accommodate SS UL-MAP processing time >= 200 us	10.1	m	
8	Accommodate SS Ranging response time >= 1 ms	10.1	m	
9	Accommodate TFTP Backoff Start >= 1 s	10.1	m	
10	Accommodate TFTP Backoff End >= 16 s	10.1	m	
11	Send DSx-RSP within 1 s	10.1	m	
12	Send DSx-ACK within 300 ms of receiving DSx-RSP	10.1	m	
13	Send SBC-REQ within 300 ms of receipt of RNG-RSP (success)	10.1	m	
14	Send TFTP-CPLT within 15 min of receipt of REG-RSP	10.1	m	

c1: If (profM1) then 1595 else if (profM2) then 1295 else 4096.

Table A94—SS Global Parameters Local Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	DL-MAP Interval	10.1	m		c1	
2	CLK-CMP Interval	10.1	m		50 ms	
3	Lost DL-MAP Interval	10.1	m		100 ms .. 600 ms	
4	Lost UL-MAP Interval	10.1	m		100 ms .. 600 ms	
5	Contention Ranging Retries	10.1	m		>= 16	
6	Invited Ranging Retries	10.1	m		>= 16	
7	Request Retries	10.1	m		>= 16	
8	Registration Request Retries	10.1	m		>= 3	
9	Data Retries	10.1	n/a		n/a	
10	Mini-slot size	10.1	m		c2	
11	DSx Request Retries	10.1	m		3	
12	DSx Response Retries	10.1	m		3	
13	TFTP Download Retries	10.1	m		3	
14	TFTP Wait	10.1	m		10 min	

Table A94—SS Global Parameters Local Support

15	ToD Retries	10.1	m		3	
16	ToD retry period	10.1	m		>= 5 min	
17	T1	10.1	m		50 s	
18	T2	10.1	m		10 s	
19	T3	10.1	m		200 ms	
20	T4	10.1	m		30s .. 35s	
21	T5	10.1	c3		2s	
22	T6	10.1	m		3s	
23	T7	10.1	m		1s	
24	T8	10.1	m		300 ms	
25	T10	10.1	m		3s	
26	T12	10.1	m		50s	
27	T14	10.1	m		200 ms	

c1: If (profP1 or profP2) then 1 ms else n/a.
c2: If (profP1 or profP2) then 2 else n/a.
c3: If (profP1 or profP2) then n/a else m.

A.6.3.1.2 PKM Parameter Values

Table A95—SS PKM Parameters Remote Support

Item	Capability	Reference	Status	Support
1	Accept AK Lifetimes in range 1..70 days	10.2	m	
2	Accept TEK Lifetimes in range 30 min..7 days	10.2	m	
3	Accept test AK Lifetime of 5 min	10.2	m	
4	Accept test TEK Lifetime of 3 min	10.2	m	
5	TEK Grace Time < ½ TEK Lifetime	10.2	m	

Table A96—SS PKM Parameters Local Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Authorization Wait Timeout	10.2	m		2s..30s	
2	Reauthorization Wait Timeout	10.2	m		2s..30s	
3	Authorization Grace Time	10.2	m		5 min .. 35 days	
4	Operational Wait Timeout	10.2	m		1s..10s	
5	Rekey Wait Timeout	10.2	m		1s..10s	
6	TEK Grace Time	10.2	m		5 min .. 3.5 days	
7	Authorize reject Wait Timeout	10.2	m		10 s .. 10 min	
8	Test Authorization Grace Time	10.2	m		1 min	
9	Test Grace Time	10.2	m		1 min	

A.6.3.1.3 10-66 GHz PHY Specific Values

Table A97—SS PHY-Specific Parameters Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Physical Slot	10.3	m		4 QAM symbols	
2	Symbol Rate	10.3	m		c1	
3	UL center frequency	10.3	m		Multiple of 250 kHz within frequency band of operation	
4	Tolerated Poll Jitter	10.3	n/a		<= 3000 usec	

c1: if (profP1) then 20 mbaud else if (profP2) then 22.4 mbaud

A.6.3.1.4 Well Known Addresses and Identifiers

Table A98—SS Well Known CIDs

Item	Capability	Reference	Status	Support
1	Initial Ranging = 0x0000	10.4	m	
2	0x0000 < Basic CID < Primary Management CID < (Transport and Secondary Management CIDs) < 0xFF00	10.4	m	
3	Multicast Polling CIDs in range 0xFF00 .. 0xFFFE	10.4	c1	
4	Broadcast CID = 0xFFFF	10.4	m	

c1: If Table A31/2 then m else n/a

A.6.3.2 MAC Management Message Encodings

A.6.3.2.1 UCD Message Encodings

Table A99—SS UCD Channel Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Burst descriptor	11.1.1.1	m		See Table A100	
2	Symbol Rate	11.1.1.1	n/a		n/a	
3	Frequency	11.1.1.1	n/a		n/a	
4	SS transition Gap	11.1.1.1	m		>= 6 PS	
5	Roll-off Factor	11.1.1.1	n/a		0.25	
6	Power Adjustment Rule	11.1.1.1	m		0..1	
7	Random Access Time-out	11.1.1.1	m		>0	

Table A100—SS UCD Burst Profile Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Modulation Type	11.1.1.2	m		1..3	
2	Preamble length	11.1.1.2	m		16, 32	
3	FEC Code Type	11.1.1.2	m		1..2	
4	RS Information Bytes	11.1.1.2	m		6..255	
5	RS parity bytes	11.1.1.2	m		0-32	
6	BCC Code Type	11.1.1.2	m		1	
7	BTC Code Type	11.1.1.2	n/a			
8	BTC Row Code Type	11.1.1.2	n/a			
9	BTC Column Type	11.1.1.2	n/a			
10	BTC Interleaving Type	11.1.1.2	n/a			
11	Scrambler Seed	11.1.1.2	m			
12	Last Codeword Length	11.1.1.2	m		c1	

c1: if (FEC Code Type = 1) then 1 else 2

A.6.3.2.2 DCD Message Encodings

Table A101—SS DCD Channel Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Burst descriptor	11.1.2.1	m		See SS DCD Burst Profile Encodings Sup-portA-102	
2	BS Transmit Power	11.1.2.1	m			
3	Frame Duration	11.1.2.1	n/a			
4	Downlink PHY Type	11.1.2.1	m		c1	
5	Power Adjustment Rule	11.1.2.1	m		0..1	

c1: If (profP1t || profP2t) then 0
else if (profP2f || profP2f) then 1

Table A102—SS DCD Burst Profile Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Modulation Type	11.1.2.2	m		1..3	
2	FEC Code Type	11.1.2.2	m		1..2	
3	RS Information Bytes	11.1.2.2	m		6..255	
4	RS parity bytes	11.1.2.2	m		0-32	
5	BCC Code Type	11.1.2.2	m		1	
6	BTC Code Type	11.1.2.2	n/a			
7	BTC Row Code Type	11.1.2.2	n/a			
8	BTC Column Type	11.1.2.2	n/a			
9	BTC Interleaving Type	11.1.2.2	n/a			
10	Last Codeword Length	11.1.2.2	m		c1	
11	DIUC Mandatory exit Threshold	11.1.2.2	m			
12	DIUC minimum entry Threshold	11.1.2.2	m			
13	Preamble present	11.1.2.2	m		0..1	

c1: if (FEC Code Type = 1) then 1 else 2

A.6.3.2.3 RNG-REQ Message Encodings

Table A103—SS RNG-REQ Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Requested Downlink Burst Type	11.1.3	m		0..12	
2	SS MAC Address	11.1.3	m			
3	Ranging Anomalies	11.1.3	m		[0,1,2,4,5,6]	

A.6.3.2.4 RNG-RSP Message Encodings

Table A104—SS RNG-RSP Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Timing Adjust	11.1.4	m			
2	Power Level Adjust	11.1.4	m			
3	Offset Frequency Adjust	11.1.4	n/a			
4	Ranging status	11.1.4	m		1..4	
5	Downlink Frequency over-ride	11.1.4	m			
6	Uplink Channel ID Override	11.1.4	n/a			
7	Downlink operational burst profile	11.1.4	m		0..12	
8	SS MAC Address	11.1.4	m			
9	Basic CID	11.1.4	m		0x0001 .. m	
10	Primary Management CID	11.1.4	m		m+1 .. 2m	

A.6.3.2.5 MCA-REQ Message Encodings

Table A105—SS MCA-REQ Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Multicast CID	11.1.5	m		0xFF00 .. 0xFFFE	
2	Assignment	11.1.5	m		0..1	

A.6.3.3 PKM Message Encodings

Table A106—PKM Message Encodings support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Display-string	11.2.1	o			
2	AUTH-Key	11.2.2	m			
3	TEK	11.2.3	m			
4	Key-Lifetime	11.2.4	m			
5	Key-Sequence-Number	11.2.5	m		AK:0-15 TEK:0-3	
6	HMAC-Digest	11.2.6	m			
7	SAID	11.2.7	m			
8	TEK-Parameters	11.2.8	m			
9	CBC-IV	11.2.9	m			
10	Error-Code	11.2.10	m		0-6	
11	CA-Certificate	11.2.11	m			
12	SS-Certificate	11.2.12	m			
13	Security-Capabilities	11.2.13	m			
14	Cryptographic-Suite	11.2.14	m		0x000001 0x010001	
15	Cryptographic-Suite-List	11.2.15	m			
16	Version	11.2.16	m		1	
17	SA-Descriptor	11.2.17	m			
18	SA-Type	11.2.18	m		0,1,2	
19	PKM Configuration Setting	11.2.19	m			

Table A107—PKM Configuration Settings support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Authorize Wait Timeout	11.2.19	m		2-30s	
2	Reauthorize Wait Timeout	11.2.19	m		2-30s	
3	Authorization Grace Time	11.2.19	m		60s, 300 – 3024000s	
4	Operational Wait Timeout	11.2.19	m		1-10s	
5	Rekey Wait Timeout	11.2.19	m		1-10s	
6	TEK Grace Time	11.2.19	m		60s, 300-3023999s	
7	Authorize Reject Wait Time-out	11.2.19	m			

A.6.3.4 Common Encodings

This subclause covers the requirements of section 11.4 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A108—Common Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	SS Capabilities Encodings	11.4.1	m			
2	SS Message Integrity Check	11.4.2	m			
3	Vendor ID Encoding	11.4.3				
4	MAC Version Encoding	11.4.4	m			
5	Convergence sublayer Capabilities	11.4.5	m			
6	TFTP Server Timestamp	11.4.6	m			
7	TFTP Server Provisioned SS Address	11.4.7	m			
8	Service Flow Encodings	11.4.8	m			
9	Convergence Sublayer Specific Flow Encodings	11.4.9	m			
10	HMAC Tuple	11.4.10	m			
11	Vendor Specific Information	11.4.11	m			
12	Confirmation Code	11.4.12	m			

A.6.3.4.1 SS Capabilities Encodings

This subclause covers the requirements of section 11.4.1 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A109—SS Capabilities Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Uplink CID support	11.4.1.1	m		>= 3	
2	Physical parameter support	11.4.1.2	m			
3	PKM Flow Control	11.4.1.3	m		0-255	
4	DSx Flow Control	11.4.1.4	m		0-255	
5	MCA Flow Control	11.4.1.5	m		0-255	
6	Bandwidth allocation support	11.4.1.6	m		0x01, 0x03	
7	IP Version	11.4.1.7	m		0x01, 0x03	
8	MAC CRC Support	11.4.1.8	m		0, 1	
9	Multicast Polling Group CID Support	11.4.1.9	c1		>= 4	

c1: If Table A31/2 then m else n/a

A.6.3.4.1.1 SS PHY Parameter Encodings

Table A110—SS PHY Parameter Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
2	10-66 GHz PHY SS Demodulator Types	11.4.1.2.1	m		0x03, 0x07	
3	10-66 GHz PHY SS Modulator Types	11.4.1.2.2	m		0x01, 0x03, 0x07	
4	10-66 GHz SS Downlink FEC Types	11.4.1.2.3	m		0x03, 0x07	
5	10-66 GHz SS Uplink FEC Types	11.4.1.2.4	m		0x03, 0x07	

A.6.3.4.2 Convergence Sublayer Capabilities Encodings

This subclause covers the requirements of section 11.4.5 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A111—Convergence Sublayer Capabilities Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Convergence Sublayer Support	11.4.5.1	m		1-511	
2	Maximum Number of Classifier	11.4.5.2	m		0-(2^{16}-1)	
3	Payload Header Suppression Support	11.4.5.3	m		0,1,2	

A.6.3.4.3 Service Flow Encodings

This subclause covers the requirements of section 11.4.8 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A112—Service Flow Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Service Flow ID	11.4.8.1	m		1 – 4294967295	
2	Connection Identifier	11.4.8.2	m		2049 – 65279 (assumes m=1024)	
3	Service Class Name	11.4.8.3	x			
4	Service Flow Error Parameter Set	11.4.8.4	m			
5	Quality of Service Parameter Set Type	11.4.8.5	m		0x00 – 0x07	
6	Traffic Priority	11.4.8.6	m		0-7	
7	Maximum Sustained Traffic Rate	11.4.8.7	m		0 – (2^{32}-1)	

Table A112—Service Flow Encodings

8	Maximum Traffic Burst	11.4.8.8	m		$0 – (2^{32}-1)$	
9	Minimum Reserved Traffic Rate	11.4.8.9	m		$0 – (2^{32}-1)$	
10	Vendor Specific QoS Parameters	11.4.8.10	m			
11	Service Flow Scheduling Type	11.4.8.11	m		2-4, 6	
12	Request Transmission Policy	11.4.8.12	m		Bit 0: 0,1 Bit 2: 0,1 Bit 3: 0,1 Bit 4: 0,1 Bit 5: 0,1 Bit 6: 0,1	Bit 0: Bit 2: Bit 3: Bit 4: Bit 5: Bit 6:
13	Tolerated Jitter	11.4.8.13	m		>= 1 ms	
14	Maximum Latency	11.4.8.14	n/a		n/a	
15	Fixed-Length vs. Variable Length PDU Indicator	11.4.8.15	m		0, 1	
16	SDU Size	11.4.8.16	c1		49, 51, 52	
17	Target SAID	11.4.8.17	m			

c1: If profM1 then m else n/a

A.6.3.4.3.1 Service Flow Error Parameters

Table A113—Service Flow Error Parameters

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Errored Parameter	11.4.8.4	m			
2	Error Code	11.4.8.4	m		1-14	
3	Error Message	11.4.8.4	o			

A.6.3.4.4 Convergence Sublayer Specific Service Flow Encodings

This subclause covers the requirements of section 11.4.9 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A114—Convergence Sublayer Specific Service Flow Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Convergence Sublayer Specification	11.4.9.1	m		0-8	
2	Convergence Sublayer Parameter Encoding Rules	11.4.9.2	m			
3	Packet CS Encodings for Configuration and MAC Layer Messaging	11.4.9.3	c1			
4	ATM CS Encodings for Configuration and MAC Layer Messaging	1.4.9.4	c2			

c1: If profM2 then m else n/a
c2: If profM1 then m else n/a

A.6.3.4.4.1 Packet CS Encodings

This subclause covers the requirements of section 11.4.9.3 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A115—Packet CS Encodings

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Dynamic Service Change Action	11.4.9.3	m		0, 1, 2	
2	Classifier Error Parameter Set	11.4.9.3	m			
3	Packet Classification Rule	11.4.9.3	m			
4	Payload Header Suppression Rule	11.4.9.3	m			

A.6.3.4.4.1.1 Classifier Error Parameter Set

Table A116—Classifier Error Parameters Set Parameters

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Errored Parameter	11.4.9.3	m			
2	Error Code	11.4.9.3	m		1-6, 8-13	
3	Error Message	11.4.9.3	o			

A.6.3.4.4.1.2 Packet Classification Rule Parameters

Table A117—Packet Classification Rule Parameters

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Classifier Rule Priority	11.4.9.3	m		0-255	
2	IP TOS/DSCP Range and Mask	11.4.9.3	c1			
3	Protocol	11.4.9.3	c1			
4	IP masked source address	11.4.9.3	c1			
5	IP Destination Address	11.4.9.3	c1			
6	Protocol Source Port Range	11.4.9.3	c1			
7	Protocol Destination Port Range	11.4.9.3	c1			
8	Ethernet Destination MAC Address	11.4.9.3	c2			
9	Ethernet Source MAC address	11.4.9.3	c2			

Table A117—Packet Classification Rule Parameters

Prerequisite profM2

10	Ethertype/IEEE 802.2 SAP	11.4.9.3	c2			
11	IEEE 802.1D User Priority	11.4.9.3	c3			
12	IEEE 802.1Q VLAN_ID	11.4.9.3	c3			
13	Associated Payload Header Suppression Index	11.4.9.3	m		0-255	
14	Vendor Specific Classifier Parameters	11.4.9.3	m			
15	Dynamic Service Change Action	11.4.9.3	m			
16	PHS Error Parameter Set	11.4.9.3	c4			
17	Errored Parameter	11.4.9.3	c4			
18	Error Code	11.4.9.3	c4			
19	Error Message	11.4.9.3	c4			

c1: If Table A4/(1, 2, 5, 6, 7, or 8) then m else n/a \\ IP
c2: If Table A4/(3, 4, 5, 6, 7, or 8) then m else n/a \\ Ethernet
c3: If Table A4/(4, 7, or 8) then m else n/a \\ VLAN
c4: If Table A5/7 then m else n/a\\ PHS

A.6.3.4.4.1.3 Payload Header Suppression Rule Parameter Set

Table A118—Classifier Error Parameters Set Parameters

Prerequisite: (profM2 and Table A5/7)

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	PHSI	11.4.9.3	m		1-255	
2	PHSF	11.4.9.3	m			
3	PHSM	11.4.9.3	m			
4	PHSS	11.4.9.3	m			
5	PHSV	11.4.9.3	m		0, 1	
6	Vendor Specific	11.4.9.3	m			

A.6.3.4.4.2 ATM CS Encodings

This subclause covers the requirements of section 11.4.9.4 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A119—ATM CS Encodings

Prerequisite: profM1

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	ATM Switching Encodings	11.4.9.4	m		0, 1, 2	
2	VPI Classifier	11.4.9.4	m		0x00XX	
3	VCI Classification	11.4.9.4	m			

A.6.4 Major SS Capabilities and Functionalities of the PHY

This subclause covers the requirements of section 8 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.6.4.1 Multiplexing and Multiple Access Schemes

This subclause covers the requirements of section 8.2 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A120—Multiplexing and Multiple Access - SS

Item	Capability	Reference	Status	Support
1	Framed FDD	8.2.4.1	c1	
2	Full Duplex FDD	8.2.4.1	c2	
3	Half-Duplex FDD	8.2.4.1	c2	
4	TDD	8.2.4.2	c3	

Table A120—Multiplexing and Multiple Access - SS

5	Tx/Rx Transition Gap	8.2.4.2.1	c4	
6	Rx/Tx Transition Gap	8.2.4.2.2	c4	
7	Downlink - Demodulate TDM portion of burst	8.2.5	m	
8	Downlink - Demodulate TDMA portion of burst	8.2.5	c1	
9	Uplink Burst Subframe Structure – support contention slots for initial access	8.2.6	m	
10	Uplink Burst Subframe Structure – support contention slots for bandwidth request	8.2.6	m	
11	Uplink Burst Subframe Structure – support scheduled slots	8.2.6	m	
12	Uplink Burst Profile Modes	8.2.6	m	
13	DL frequency < UL Frequency unless otherwise required by regulators.		c5	
14	For an instance of a TDD channel or an instance of an FDD UL/DL pair, UL and DL use the same polarization		m	

o.1: Exactly one of these options must be supported
c1: If (profP1f or profP2f) then m else n/a
c2: If Table A120/1 then o.1 else n/a
c3: If (profP1t or profP2t) then m else n/a
c4: If (Table A120/3 or Multiplexing and Multiple Access - SS/4) then m else n/a
c5: If Table A120/1 then m else n/a

A.6.4.2 Downlink Physical layer

This subclause covers the requirements of section 8.2.5 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A121—Downlink Physical Layer – SS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Control portion	8.2.5	m			
2	TC sublayer	8.2.5	m			
3	Randomization	8.2.5	m			
4	RS outer code – frame control	8.2.5	m		T=10	
5	RS outer code – other bursts	8.2.5	m		t=0 t=4 t=8 t=12	
6	RS outer code – other bursts	8.2.5	o		t=0-16	
7	Fixed codeword operation	8.2.5	m			
8	Shortened last codeword operation	8.2.5	m			
9	BCC inner code	8.2.5	m			
10	Parity check inner code	8.2.5	o			
11	Block Turbo code	8.2.5	I			
12	Frame preamble	8.2.5	m		32 sym	
13	Burst preamble	8.2.5	c1		16 sym	
14	Gray coded constellation mapping	8.2.5	m			
15	QPSK	8.2.5	m			
16	16-QAM	8.2.5	m			
17	64-QAM	8.2.5	o			
18	Power Adjustment Rule – Peak Power	8.2.5	m			
19	Power Adjustment Rule – Average Power	8.2.5	o			
20	RS Outer Code – Information Block Length	8.2.5	m		6..255	

c1: if (ProfP1f or ProfP2f) then m else n/a// burst preamble allowed only for FDD

A.6.4.3 Uplink Physical Layer

This subclause covers the requirements of section 8.2.6 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A122—Uplink Physical Layer – SS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	TC sublayer	8.2.6	m			
2	Randomization with programmable seed	8.2.6	m			
3	RS outer code – initial ranging	8.2.6	m		T = 10	
4	RS outer code – other bursts	8.2.6	m		t=0 t=4 t=8 t=12	
5	RS outer code – other bursts	8.2.6	o		t=0-16	
6	Fixed codeword operation	8.2.6	o			
7	Shortened last codeword operation	8.2.6	m			
8	BCC inner code	8.2.6	m			
9	Parity check inner code	8.2.6	o			
10	Block Turbo code		I			
11	Burst preamble	8.2.6	m		16 sym repeated 1..2	
12	Gray coded constellation mapping	8.2.6	m			

Table A122—Uplink Physical Layer – SS

13	QPSK	8.2.6	m			
14	16-QAM	8.2.6	o			
15	64-QAM	8.2.6	o			
16	Baseband pulse shaping roll-off = 0.25	8.2.6	m			
17	Baseband pulse shaping roll-off = 0.15	8.2.6	i			
18	Baseband pulse shaping roll-off = 0.35	8.2.6	i			
19	Transmitted waveform	8.2.6	m			
20	RS Outer Code – Information Block Length	8.2.6	m		6..255	
21	Power Adjustment Rule – Peak Power	8.2.6	m			
22	Power Adjustment Rule – Average Power	8.2.6	o			

A.6.4.4 Baud Rates and Channel Widths

This subclause covers the requirements of section 8.2.7 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A123—Baud Rates and Channel Widths - SS

Item	Capability	Reference	Status	Support
1	Implement 20 Mbaud symbol rate	8.2.7	c1	
2	Implement 22.4 Mbaud symbol rate	8.2.7	c2	
3	Implement 16 Mbaud symbol rate	8.2.7	i	
4	Implement 1 ms frame duration	8.2.7	m	
5	Implement 5000 physical slots per frame	8.2.7	c1	
6	Implement 5600 physical slots per frame	8.2.7	c2	
7	Implement 4000 physical slots per frame	8.2.7	i	

c1: If profP1, m else x// 25 MHz channel
c2: If profP2, m else x// 28 MHz channel

A.6.4.5 Radio Subsystem Control

This subclause covers the requirements of section 8.2.8 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A124—Radio Subsystem Control – SS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	SS adjusts TX frequency based on frequency offset data from BS.	8.2.8	N/A			
2	SS adjusts TX power based on power level data from BS.	8.2.8	m			
3	SS TX power control algorithm dynamic range.	8.2.8	m		>=40 dB	
4	SS TX power control algorithm slew rate.	8.2.8	m		>= 10 dB/ sec	
5	SS TX power control algorithm accounts for effects of different burst profiles on RF power amp	8.2.8	m			

A.6.4.6 Minimum Performance

This subclause covers the requirements of section 8.2.9 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A125—Minimum Performance - SS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Tx Dynamic range	8.2.9	m		>= 40 dB	
2	Rx Dynamic Range	8.2.9	m		>= 40 dB for QPSK	
3	Tx RMS Power Level at Maximum Power Level Setting for QPSK	8.2.9	m		>= 15 dBm	
4	Tx Power Level minimum adjustment step	8.2.9	m		0.5 dB	
5.1	Tx Power level adjustment step accuracy Step size [0.5, 2) dB	8.2.9	m		monotonic	
5.2	Tx Power level adjustment step accuracy Step size [2, 5) dB	8.2.9	m		+/- 2 dB	
5.3	Tx Power level adjustment step accuracy Step size >= 5 dB	8.2.9	m		+/- 3 dB	
6	Peak-to-peak symbol jitter, referenced to the previous symbol zero crossing of the transmitted waveform, as percentage of the nominal symbol duration when measured over a 2 second period	8.2.9	m		2 %	
7	The SS shall lock its symbol clock to the BS	8.2.9	m			
8	Tx burst timing step size	8.2.9	m		+/- 0.25 of a symbol	
9	Tx burst timing step accuracy	8.2.9	m		+/- 0.125 of a symbol	
10	The SS shall lock its RF frequency to the BS	8.2.9	m			
11	Spectral mask (OOB)	8.2.9	m		Local regulation	
12	Ramp up/ramp down time	8.2.9	m		<= 24 symbols	
13	Output noise power spectral density when Tx is not transmitting	8.2.9	m		<= -80 dBm/MHz	

Table A125—Minimum Performance - SS

14	Modulation accuracy when measured with an ideal receiver without an equalizer for QPSK	8.2.9	m		12%	
15	Modulation accuracy when measured with an ideal receiver without an equalizer for 16-QAM	8.2.9	m		6%	
16	Modulation accuracy when measured with an ideal receiver without an equalizer for 64-QAM	8.2.9	m		2%	
17	Modulation accuracy when measured with an ideal receiver with an equalizer for QPSK	8.2.9	m		10%	
18	Modulation accuracy when measured with an ideal receiver with an equalizer for 16-QAM	8.2.9	m		3%	
19	Modulation accuracy when measured with an ideal receiver with an equalizer for 64-QAM	8.2.9	m		1.5%	
20	BER performance threshold for QPSK, BER=10^{-3}	8.2.9	m		-94 + 10log(c3) dBm	
21	BER performance threshold for 16-QAM, BER=10^{-3}	8.2.9	m		-87 + 10log(c3) dBm	
22	BER performance threshold for 64-QAM, BER=10^{-3}	8.2.9	m		-79 + 10log(c3) dBm	
23	BER performance threshold for QPSK, BER=10^{-6}	8.2.9	m		-90 + 10log(c3) dBm	
24	BER performance threshold for 16-QAM, BER=10^{-6}	8.2.9	m		-83 + 10log(c3) dBm	
25	BER performance threshold for 64-QAM, BER=10^{-6}	8.2.9	m		-74 + 10log(c3) dBm	
26	Transition time from Tx to Rx and from Rx to Tx	8.2.9	c1		c2	
27	1st adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for QPSK	8.2.9	m		-9 dB	

Table A125—Minimum Performance - SS

28	1st adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for 16-QAM	8.2.9	m		-2 dB	
29	1st adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for 64-QAM	8.2.9	m		+5 dB	
30	1st adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for QPSK	8.2.9	m		-5 dB	
31	1st adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for 16-QAM	8.2.9	m		+2 dB	
32	1st adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for 64-QAM	8.2.9	m		+9 dB	
33	1st adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for QPSK	8.2.9	m		-5 dB	
34	1st adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for 16-QAM	8.2.9	m		+2 dB	
35	1st adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for 64-QAM	8.2.9	m		+9 dB	
36	1st adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for QPSK	8.2.9	m		-1 dB	
37	1st adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for 16-QAM	8.2.9	m		+6 dB	
38	1st adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for 64-QAM	8.2.9	m		+13 dB	
39	2nd adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for QPSK	8.2.9	m		-34 dB	
40	2nd adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for 16-QAM	8.2.9	m		-27 dB	
41	2nd adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for 64-QAM	8.2.9	m		-20 dB	

Table A125—Minimum Performance - SS

42	2nd adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for QPSK	8.2.9	m		-30 dB	
43	2nd adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for 16-QAM	8.2.9	m		-22 dB	
44	2nd adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for 64-QAM	8.2.9	m		-16 dB	
45	2nd adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for QPSK	8.2.9	m		-30 dB	
46	2nd adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for 16-QAM	8.2.9	m		-23 dB	
47	2nd adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for 64-QAM	8.2.9	m		-16 dB	
48	2nd adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for QPSK	8.2.9	m		-26 dB	
49	2nd adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for 16-QAM	8.2.9	m		-20 dB	
50	2nd adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for 64-QAM	8.2.9	m		-12 dB	
51	Tx Power Level absolute accuracy	8.2.9	m		+/- 6 dB	

c1: if (Table A120/3 or Table A120/4) m else x/* define only for HD FDD and TDD */
c2: if Table A120/3 then 20 us /* HD FDD */
else if Table A120/4 then 2 us else I/* TDD */
c3: if (profP1) then 25 else if (profP2) then 28

A.6.5 SS Test Modes

Table A126—SS Stand Alone Test Modes

Item	Capability	Reference	Status	Support
1	Turn off modulation and transmit a sine wave corresponding to the center frequency of the selected channel, using the same component as during normal transmission.		m	

A.7 Base Station

This subclause contains the PICS proforma tables related to the Base Station. They need to be completed for description of BS implementations only.

Prerequisite: Table A2/2 Base Station

A.7.1 Major BS Capabilities and Functionalities of the MAC

A.7.1.1 Convergence Sublayers

This subclause covers the requirements in section 5 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.7.1.1.1 ATM Convergence Sublayer

This subclause covers the requirements of section 5.1 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A127—ATM Convergence Sublayer Capabilities

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VP switched mode classification	5.1.2.2.1	m	
2	VC switched mode classification	5.1.2.2.2	m	
3	Payload Header Suppression – VP mode	5.1.2.3.1	m	
4	Payload Header Suppression – VC mode	5.1.2.3.2	m	
5	ATM UNI Signaling	5.1.2.4	x	
6	CCS connection setup	5.1.2.4	c1	

c1: If Table A127/5 THEN m ELSE x

A.7.1.1.2 Packet Convergence Sublayer

This subclause covers the requirements of section 5.2 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A128—Packet Convergence Sublayer Protocol Support

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	IPv4	5.2	m	
2	IPv6	5.2	o	
3	802.3 Ethernet	5.2	o	
4	802.1Q VLAN	5.2	o	
5	IPv4 over 802.3 Ethernet	5.2	c1	
6	IPv6 over 802.3 Ethernet	5.2	c1	
7	IPv4 over 802.1Q VLAN	5.2	c2	
8	IPv6 over 802.1Q VLAN	5.2	c2	

c1: If Table A128/3 THEN o ELSE i
c2: If Table A128/4 THEN o ELSE i

Table A129—BS Packet Convergence Sublayer Capabilities

Item	Capability	Reference	Status	Support
1	Payload header suppression support	5.2.4	o	
2	Map packets to correct connection		m	

A.7.1.2 Addressing and Connections

This subclause covers the requirements of section 6.2.1 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A130—Addressing and Connections

Item	Capability	Reference	Status	Support
1	MAC Management messages only on applicable CIDs	6.2.1	m	
2	Packets related to DHCP for SS IP address establishment and maintenance transmitted on the secondary management connection.	6.2.9.10	m	
3	Packets related to Time protocol during initialization and maintenance of ToD transmitted on the secondary management connection.	6.2.9.11	m	
4	Packets from the TFTP server during initialization and maintenance transmitted on the secondary management connection.	6.2.9.12	m	
5	User data only on transport connections	6.2.1	m	

A.7.1.3 Construction and Transmission of MAC PDUs

This subclause covers the requirements of section 6.2.3 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.7.1.3.1 Conventions

Table A131—Transmission Conventions

Item	Capability	Reference	Status	Support
1	Transmit messages most significant byte first	6.2.3.1	m	
2	Transmit bytes most significant bit first	6.2.3.1	m	

A.7.1.3.2 PDU Concatenation

Table A132—PDU Concatenation

Item	Capability	Reference	Status	Support
1	Concatenate Multiple MAC PDUs into a single burst of like burst profile.	6.2.3.2	m	
2	Receive concatenated MAC PDUs and determine disposition via CID.	6.2.3.2	m	

A.7.1.3.3 SDU Fragmentation

Table A133—SDU Fragmentation

Item	Capability	Reference	Status	Support
1	Fragment a MAC SDU into multiple MAC PDUs	6.2.3.3	m	
2	Correctly set the FC bits	6.2.3.3	m	
3	Increment the FSM modulo 8	6.2.3.3	m	
4	Receive and reassemble fragmented SDUs.	6.2.3.3	m	
5	Discard SDUs corrupted due to loss of fragment	6.2.3.3	m	

A.7.1.3.4 Packing

Table A134—Packing

Item	Capability	Reference	Status	Support
1	Pack Fixed length PDUs	6.2.3.4.1	c2	
2	Receive (unpack) fixed length PDUs	6.2.3.4.1	c1	
3	Pack variable length PDUs	6.2.3.4.2	o	
4	Receive (unpack) variable length PDUs	6.2.3.4.2	m	
5	Pack variable length PDUs with fragmentation	6.2.3.4.2	c3	
6	Receive (unpack) variable length PDUs with fragmentation	6.2.3.4.2	m	
7	Packing of PDUs on Basic and Initial Ranging connections	6.2.2.3	x	

c1: If profM1 THEN m ELSE I
c2: If profM1 THEN o ELSE I
c3: Packing/3 THEN o ELSE n/a

A.7.1.3.5 CRC

Table A135—CRC

Item	Capability	Reference	Status	Support
1	Compute and add CRC	6.2.3.5	c1	
2	Check CRC	6.2.3.5	c1	

c1: If profM2 THEN m ELSE o

A.7.1.4 Uplink Scheduling Service

This subclause covers the requirements of section 6.2.5 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A136—Scheduling services support

Item	Capability	Reference	Status	Support
1	UGS	6.2.5.1	m	
2	rtPS	6.2.5.2	m	
3	nrtPS	6.2.5.3	m	
4	BE	6.2.5.4	m	

A.7.1.5 Bandwidth Allocation and Request Mechanism

This subclause covers the requirements of section 6.2.6 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A137—Bandwidth Allocation and Request Mechanism

Item	Capability	Reference	Status	Support
1	Receive bandwidth requests via Bandwidth Request Header	6.2.6.1	m	
2	Receive bandwidth requests via piggyback request	6.2.6.1	m	
3	Accept aggregate bandwidth requests	6.2.6.1	m	
4	Accept incremental bandwidth requests	6.2.6.1	m	
5	Transmit Request IE	6.2.6.1	o	
6	Transmit Data Grant IE	6.2.6.1	m	
7	GPC mode	6.2.6.2	x	
8	GPSS mode	6.2.6.3	m	
9	Unicast Polls	6.2.6.4.1	m	
10	Broadcasts Polls	6.2.6.4.2	o	
11	Multicast Polls	6.2.6.4.2	c1	
12	Accept Poll-me Bit	6.2.6.4.3	m	

c1: If Multicast Polling Groups – BS/1 then m else n/a

A.7.1.6 MAC Support of PHY layers

This subclause covers the requirements of section 6.2.7 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A138—MAC Support of PHY Layers – BS

Item	Capability	Reference	Status	Support
1	Framed FDD	6.2.7.2	c1	
2	Respect Half Duplex Nature of half-duplex FDD Terminals	6.2.7.2	c2	
3	Schedule full-duplex terminals for full-duplex operation	6.2.7.2	c4	
4	Use TDMA portion of DL for half-duplex terminals, as necessary	6.2.7.2	c4	
5	TDD	6.2.7.3	c3	
6	Downlink Map	6.2.7.4	m	
7	Uplink Map	6.2.7.5	m	

c1: If (profP1f or profP2f) then m else n/a
c2: If Table A138/1 then m else n/a
c3: If (profP1t or profP2t) then m else n/a
c4: If Table A138/1 then o else n/a

Table A139—Map Relevance – BS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Minimum Map Relevance	6.2.7.6.1	m		200 us + round trip delay	
2	Maximum Map relevance	6.2.7.6.1	m		c1	

c1: If (profP1f or profP2f) then 1 ms
else if (profP1t or ProfP2t) them 1 ms + TDD split

A.7.1.7 Contention resolution

This subclause covers the requirements of section 6.2.8 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

There are no specific requirements on the BS.

A.7.1.8 Network Entry and Initialization

This subclause covers the requirements of section 6.2.9 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A140—Network entry and Initialization

Item	Capability	Reference	Status	Support
1	Transmit Downlink Parameters	6.2.9.2	m	
2	Transmit Uplink Parameters	6.2.9.3	m	
3	Initial Ranging	6.2.9.5	m	
4	Negotiate Basic Capabilities	6.2.9.7	m	
5	SS Authorization	6.2.9.8, 7.2	m	
6	Registration	6.2.9.9	m	

A.7.1.8.1 Transmit Downlink Parameters

Table A141—Obtain Downlink Parameters

Item	Capability	Reference	Status	Support
1	BS transmits DCD	6.2.9.2	m	

A.7.1.8.2 Obtain Uplink Parameters

Table A142—Obtain Downlink Parameters

Item	Capability	Reference	Status	Support
1	BS transmits UCD	6.2.9.3	m	

A.7.1.8.3 Initial Ranging

Table A143—Initial Ranging

Item	Capability	Reference	Status	Support
1	BS allocates Initial Ranging slot(s)	6.2.9.5	m	
2	BS assigns Basic and Primary Management CID	6.2.9.5	m	
3	BS sends RNG-RSP	6.2.9.5	m	
4	Command SS to use a different DL channel	6.2.9.6	m	
5	Change SS's DL operational burst profile	6.2.9.10.1	m	

A.7.1.8.4 Negotiate Basic Capabilities

Table A144—Obtain Downlink Parameters

Item	Capability	Reference	Status	Support
1	BS Rx SBC-REQ	6.2.9.7	m	
2	BS sends SBC-RSP	6.2.9.7	m	

A.7.1.8.5 SS Authorization

Table A145—SS Authorization

Item	Capability	Reference	Status	Support
1	BS validates certificate and checks for SS authorization	6.2.9.8, 7.2	m	
2	BS establishes the SAs of the SS	6.2.9.8, 7.2		
3	BS sends Auth Reply (PKM-REQ with *Code=5)*	6.2.9.8, 7.2	m	
4	BS sends Auth Reject	6.2.9.8, 7.2	m	

A.7.1.8.6 Registration

Table A146—Registration

Item	Capability	Reference	Status	Support
1	BS Rx REG-REQ	6.2.9.9	m	
2	BS assigns Secondary Management CID	6.2.9.9	m	
3	BS sends REG-RSP	6.2.9.9	m	
4	BS Rx REG-ACK	6.2.9.9	m	
5	BS resends REG-RSP on timeout of REG-ACK	6.2.9.9	m	

A.7.1.8.7 Establish IP Connectivity

Table A147—Establish IP Connectivity

Item	Capability	Reference	Status	Support
1	DHCP packets received on Secondary Management Connection forwarded to external interface	6.2.9.10	o.1	
2	BS Implements DHCP server	6.2.9.10	o.1	
3	Time Protocol packets received on Secondary Management Connection forwarded to external interface	6.2.9.11	o.2	
4	BS Implements Time Protocol server	6.2.9.11	o.2	
5	TFTP packets received on Secondary Management Connection forwarded to external interface	6.2.9.12	o.3	
6	BS Implements TFTP server	6.2.9.12	o.3	

o.1: At least one of these options must be implemented.
o.2: At least one of these options must be implemented.
o.3: At least one of these options must be implemented.

A.7.1.9 Establish Provisioned Connections

Table A148—Establish Provisioned Connections

Item	Capability	Reference	Status	Support
1	BS sends DSA-REQ for each pre-provisioned service flow	6.2.10	m	
2	BS receives DSA-RSPs for pre-provisioned service flows	6.2.10	m	
3	BS sends DSA-ACK for pre-provisioned service flows	6.2.10	m	
4	BS resends DSA-REQ on timeout of DSA-RSP for pre-provisioned service flows	6.2.10	m	

A.7.1.10 Periodic Ranging

This subclause covers the requirements of section 6.2.10 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A149—Periodic Ranging – BS

Item	Capability	Reference	Status	Support
1	Provide periodic ranging opportunities sufficiently often.	6.2.10	m	
2	Command SS to adjust PHY parameters in response to RNG-RSP after initial ranging	6.2.10	m	
3	Use the RNG-RSP message to command an unsolicited DL burst profile change.	6.2.10	o.1	
4	Use the DBPC-RSP message to command an unsolicited DL burst profile change.	6.2.10	o.1	
5	Use the RNG-RSP message to command a DL burst profile change in response to a RNG-REQ message.	6.2.10	m	
6	Use the DBPC-RSP message to command a DL burst profile change in response to a DBPC-REQ message.	6.2.10	m	
7	Provide Station Maintenance Intervals	6.2.10	o	

o.1: At least one of these must be implemented

A.7.1.11 Update of Channel Descriptors

This subclause covers the requirements of section 6.2.11 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A150—Update of Channel Descriptor- BS

Item	Capability	Reference	Status	Support
1	Support of two simultaneous sets of burst descriptors	6.2.11	m	
2	Transmit new uplink burst descriptors in UCD message with incremented Configuration change count at least twice	6.2.11	m	
3	Schedule transmission of the UCD messages such that every SS has the chance to hear it once	6.2.11	m	
4	Transmit new downlink burst descriptors in DCD message with incremented Configuration change count at least twice	6.2.11	m	
5	Schedule transmission of the DCD messages such that every SS has the chance to hear it once	6.2.11	m	
6	Receive with the new uplink parameters starting from the first PS that the UL-MAP with UCD Count matching the new Configuration Change Count covers	6.2.11	m	
7	Transmit with the new downlink parameters starting from the frame with the first DL-MAP with a DCD Count matching the new Configuration Change Count	6.2.11	m	

A.7.1.12 Multicast Polling Groups

Table A151—Multicast Polling Groups – BS

Item	Capability	Reference	Status	Support
1	BS supports multicast polling groups	6.2.12	o	
2	BS transmits MCA-REQ	6.2.12	c1	
3	BS receives MCA-RSP	6.2.12	c2	

c1: If Multicast Polling Groups – BS/1 then m else x
c2: If Multicast Polling Groups – BS/1 then m else n/a

A.7.1.13 Quality of Service

This subclause covers the requirements of section 6.2.13 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.7.1.13.1 Dynamic Service Flow operations

Table A152—Dynamic Service Flow operations

Item	Role	Reference	Status	Support
1	Creation – BS Initiated	6.2.13	m	
2	Creation – SS initiated	6.2.13	c1	
3	Change – BS Initiated	6.2.13	m	
4	Change – SS Initiated	6.2.13	c1	
5	Deletion – BS Initiated	6.2.13	m	
6	Deletion – SS Initiated	6.2.13	c1	

c1: if (profM1 && Table A119/5) then m else x // only for SVCs and soft-PVCs

A.7.1.13.2 SS Initiated Dynamic Service Flow creation

Table A153—SS Initiated Service Flow creation

Prerequisite: Table A152/2

Item	Role	Reference	Status	Support
1	BS receives DSA-REQ	6.2.13	x	
2	BS sends DSX-RVD	6.2.13	x	
3	BS sends DSA-RSP	6.2.13	x	
4	BS receives DSA-ACK	6.2.13	x	

A.7.1.13.3 BS Initiated Service Flow Creation

Table A154—BS Initiated Service Flow Creation

Item	Role	Reference	Status	Support
1	BS sends DSA-REQ	6.2.13	m	
2	BS receives DSA-RSP	6.2.13	m	
3	BS sends DSA-ACK	6.2.13	m	

A.7.1.13.4 SS Initiated Dynamic Service Flow Change

Table A155—SS Initiated Service Flow change

Prerequisite: Table A152/4

Item	Role	Reference	Status	Support
1	BS receives DSC-EQ	6.2.13	x	
2	BS sends DSX-RVD	6.2.13	x	
3	BS sends DSC-RSP	6.2.13	x	
4	BS receives DSC-ACK	6.2.13	x	

A.7.1.13.5 BS Initiated Service Flow Change

Table A156—BS Initiated SF Change

Item	Role	Reference	Status	Support
1	BS sends DSC-REQ	6.2.13	m	
2	BS receives DSC-RSP	6.2.13	m	
3	BS sends DSC-ACK	6.2.13	m	

A.7.1.13.6 SS Initiated Service Flow Deletion

Table A157—BS Initiated SF Deletion

Prerequisite: Table A152/6

Item	Role	Reference	Status	Support
1	BS receives DSD-REQ	6.2.13	x	
2	BS sends DSD-RSP	6.2.13	x	

A.7.1.13.7 BS Initiated Service Flow Deletion

Table A158—BS Initiated SF Change

Item	Role	Reference	Status	Support
1	BS sends DSD-REQ	6.2.13	m	
2	BS receives DSD-RSP	6.2.13	m	

A.7.1.14 BS PKM functions

This subclause covers the requirements of section 7 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A159—PKM functions

Item	Capability	Reference	Status	Support
1	BS supports X.509 certificate validation	7	m	
2	BS supports AK generation	7	m	
3	BS supports Authorization procedure	7	m	
4	BS supports TEK generation	7	m	
5	BS supports TEK exchange protocol	7	m	
6	BS supports MAC management message authentication	7	m	
7	BS supports PKM message authentication	7	m	
8	BS supports Static SAs	7	o	
9	BS supports Dynamic SAs	7	o	
10	BS supports dynamic SA mapping	7	c1	
11	Encryption	6.2.3.6	m	
12	Decryption	6.2.3.6	m	

c1 : IF PKM functions/9 then m else n/a

Table A160—SS Encryption and authentication Algorithms

Item	Capability	Reference	Status	Support
1	DES data encryption/decryption	7	m	
2	3DES KEK encryption	7	m	
3	RSA authentication with 1024 bit key	7	m	
4	RSA authentication with 2048 bit key	7	m	
5	RSA encryption with 1024 bit key	7	m	
6	HMAC with SHA-1	7	m	
7	Support SA with no encryption/decryption as encryption algorithm	7	m	

A.7.1.15 Configuration File

This subclause covers the requirements of section 9 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A161—DHCP and Configuration File

Item	Capability	Reference	Status	Support
1	Rx TFTP-CPLT	6.2.9.12	m	
2	Tx TFTP-RSP	6.2.9.12	m	
3	Await Transfer of Config File	6.2.9.12	m	

A.7.2 MAC PDU descriptions, seen from the BS

This subclause covers the requirements of the various PDU formats.

A.7.2.1 Headers and Subheaders

Table A162—Headers and Subheaders – BS

Item	Capability	Reference	Status	Support
1	Support Generic MAC Header – Tx	6.2.2.1.1	m	
2	Support Generic MAC Header – Rx	6.2.2.1.1	m	
3	Support of Bandwidth Request Header – Tx	6.2.2.1.2	x	
4	Support of Bandwidth Request Header – Rx	6.2.2.1.2	m	
5	Support Fragmentation sub-header –Tx	6.2.2.2.1	m	
6	Support Fragmentation sub-header – Rx	6.2.2.2.1	m	
7	Grant Management Subheader – Tx	6.2.2.2.2	x	
8	Grant Management Subheader – Rx	6.2.2.2.2	m	
9	Packing Subheader – Tx	6.2.2.2.3	c1	
10	Packing Subheader – Rx	6.2.2.2.3	m	

c1: If Packing/3 then m else n/a

A.7.2.2 MAC Management PDUs

This section defines the requirements for the structure of PDUs and Management messages. The requirement to receive a PDU or its parameters does not imply a requirement to act upon the PDU or parameter.

A.7.2.2.1 UCD message

Table A163—UCD Message

Item	Capability	Reference	Status	Support
1	UCD – Rx	6.2.2.3.3	n/a	
2	UCD – Tx	6.2.2.3.3	m	
3	Burst Descriptor – Tx	11.1.1.1	m	
4	Symbol Rate –Tx	11.1.1.1	x	
5	Frequency – Tx	11.1.1.1	x	
6	SS Transition Gap – Tx	11.1.1.1	c1	
7	Roll off factor – Tx	11.1.1.1	x	
8	Power Adjustment Rule – Tx	11.1.1.1	m	
9	Random Access Time-out – Tx	11.1.1.1	m	

c1: if (SS Transition Gap default) then o else m

Table A164—UL Burst Profile Encodings

Item	Capability	Reference	Status	Support
1	Modulation Type-Tx	11.1.1.2	m	
2	Preamble Length-Tx	11.1.1.2	m	
3	FEC Code Type-Tx	11.1.1.2	m	
4	RS Information Bytes-Tx	11.1.1.2	m	
5	RS parity bytes-Tx	11.1.1.2	m	
6	BTC Code Type-Tx	11.1.1.2	x	
7	BTC Row Code Type-Tx	11.1.1.2	x	
8	BTC Column Type-Tx	11.1.1.2	x	
9	BTC Interleaving Type-Tx	11.1.1.2	x	
10	Scrambler Seed-Tx	11.1.1.2	m	
11	Last Codeword Length-Tx	11.1.1.2	m	
12	BCC Code Type	11.1.1.2	x	

A.7.2.2.2 DCD message

Table A165—DCD Message

Item	Capability	Reference	Status	Support
1	DCD – Rx	6.2.2.3.1	n/a	
2	DCD – Tx	6.2.2.3.1	m	
3	Burst Descriptor – Tx	11.1.2.1	m	
4	BS Transmit Power – Tx	11.1.2.1	m	
5	Frame Duration – Tx	11.1.2.1	x	
6	DL PHY Type – Tx	11.1.2.1	m	
7	Power Adjustment Rule	11.1.2.1	m	

Table A166—DL Burst Profile Encodings

Item	Capability	Reference	Status	Support
1	Modulation Type-Tx	11.1.2.2	m	
2	FEC Code Type-Tx	11.1.2.2	m	
3	RS Information Bytes-Tx	11.1.2.2	m	

Table A166—DL Burst Profile Encodings

4	RS parity bytes-Tx	11.1.2.2	m	
5	BCC Code Type-Tx	11.1.2.2	x	
6	BTC Code Type-Tx	11.1.2.2	x	
7	BTC Row Code Type-Tx	11.1.2.2	x	
8	BTC Column Type-Tx	11.1.2.2	x	
9	BTC Interleaving Type-Tx	11.1.2.2	x	
10	Last Codeword Length-Tx	11.1.2.2	m	
11	DIUC Mandatory exit Threshold-Tx	11.1.2.2	m	
12	DIUC minimum entry Threshold-Tx	11.1.2.2	m	
13	Preamble present-Tx	11.1.2.2	c1	

c1: If (Preamble Present == TRUE) then m else o

A.7.2.2.3 DL-MAP

Table A167—DL-MAP Message

Item	Capability	Reference	Status	Support
1	DL-MAP – Rx	6.2.2.3.2	n/a	
2	DL-MAP – Tx	6.2.2.3.2	m	

A.7.2.2.4 UL-MAP

Table A168—UL-MAP Message

Item	Capability	Reference	Status	Support
1	UL-MAP – Rx	6.2.2.3.4	n/a	
2	UL-MAP – Tx	6.2.2.3.4	m	

A.7.2.2.5 RNG-REQ

Table A169—RNG-REQ Message

Item	Capability	Reference	Status	Support
1	RNG-REQ – Rx	6.2.2.3.5	m	
2	RNG-REQ – Tx	6.2.2.3.5	x	
3	Requested DL Burst Type – Rx	11.1.3	m	
4	SS MAC Address – Rx	11.1.3	m	
5	Ranging Anomalies – Rx	11.1.3	m	

A.7.2.2.6 RNG-RSP

Table A170—RNG-RSP Message

Item	Capability	Reference	Status	Support
1	RNG-RSP – Rx	6.2.2.3.6	n/a	
2	RNG-RSP – Tx	6.2.2.3.6	m	
3	Timing Adjust Information – Tx	11.1.4	m	
4	Power Adjust Information – Tx	11.1.4	m	
5	Frequency Adjust Information – Tx	11.1.4	x	
6	Ranging Status – Tx	11.1.4	m	
7	DL Frequency Override – Tx	11.1.4	m	
8	UL Channel ID Override – Tx	11.1.4	x	
9	DL Operational Burst Profile – Tx	11.1.4	m	
10	Basic CID – Tx	11.1.4	m	
11	Primary Management CID –Tx	11.1.4	m	
12	SS MAC Address – Tx	11.1.4	m	

A.7.2.2.7 REG-REQ

Table A171—REG-REQ Message

Item	Capability	Reference	Status	Support
1	REG-REQ – Rx	6.2.2.3.7	m	
2	REG-REQ – Tx	6.2.2.3.7	x	
3	HMAC Digest – Rx	11.2.6	m	
4	Vendor ID Encoding – Rx	11.4.3	m	
5	UL CID Support –Rx	11.4.1.1	m	
6	PKM Flow Control –Rx	11.4.1.3	m	
7	DSx Flow Control – Rx	11.4.1.4	m	
8	MCA Flow Control – Rx	11.4.1.5	m	
9	IP Version – Rx	11.4.1.7	m	
10	MAC CRC Support – Rx	11.4.1.8	m	

A.7.2.2.8 REG-RSP

Table A172—REG-RSP Message

Item	Capability	Reference	Status	Support
1	REG-RSP – Rx	6.2.2.3.8	n/a	
2	REG-RSP – Tx	6.2.2.3.8	m	
3	MAC Version – Tx	11.4.4	m	
4	Secondary Management CID – Tx	TBD	m	
5	HMAC Digest – Tx	11.2.6	m	
6	UL CID Support –Tx	11.4.1.1	m	
7	PKM Flow Control –Tx	11.4.1.3	m	
8	DSx Flow Control – Tx	11.4.1.4	m	
9	MCA Flow Control – Tx	11.4.1.5	m	
10	IP Version – Tx	11.4.1.7	m	
11	MAC CRC Support – Tx	11.4.1.8	m	
12	Vendor ID Encoding – Tx	11.4.3	m	
13	Vendor-specific Extensions – Tx	11.4.11	m	

A.7.2.2.9 PKM-REQ/RSP

A.7.2.2.9.1 Security Association Add parameters

Table A173—Security Association Add parameters

Item	Capability	Reference	Status	Support
1	Key Sequence Number –Tx	11.2.5	m	
2	SA Descriptors – Tx	11.2.17	m	

A.7.2.2.9.2 Auth Request parameters

Table A174—Auth Request parameters

Item	Capability	Reference	Status	Support
1	SS-Certificate –Rx	11.2.12	m	
2	Security Capabilities – Rx	11.2.13	m	

A.7.2.2.9.3 Auth Reply parameters

Table A175—Auth Request parameters

Item	Capability	Reference	Status	Support
1	AUTH-Key –Tx	11.2.2	m	
2	Key-Lifetime – Tx	11.2.4	m	
3	Key-Sequence-Number – Tx	11.2.5	m	
4	SA Descriptor – Tx	11.2.17	m	

A.7.2.2.9.4 Auth Reject parameters

Table A176—Auth Reject parameters

Item	Capability	Reference	Status	Support
1	Error code – Tx	11.2.10	m	
2	Display-String – Tx	11.2.1	o	

A.7.2.2.9.5 Key Request parameters

Table A177—Key Request parameters

Item	Capability	Reference	Status	Support
1	Key-Sequence-Number – Rx	11.2.5	m	
2	SAID – Rx	11.2.7	m	
3	HMAC-Digest – Rx	11.2.6	m	

A.7.2.2.9.6 Key Reply parameters

Table A178—Auth Reject parameters

Item	Capability	Reference	Status	Support
1	Key-Sequence-number – Tx	11.2.5	m	
2	SAID – Tx	11.2.7	m	
3	TEK-Parameters – Tx	11.2.8	m	
4	HMAC-Digest – Tx	11.2.6	m	

A.7.2.2.9.7 Key Reject parameters

Table A179—Key Reject parameters

Item	Capability	Reference	Status	Support
1	Key Sequence Number –Tx	11.2.5	m	
2	SAID – Tx	11.2.7	m	
3	Error-Code – Tx	11.2.10	m	
4	HMAC-Digest – Tx	11.2.6	m	

A.7.2.2.9.8 Authorization Invalid parameters

Table A180—Authorization Invalid parameters

Item	Capability	Reference	Status	Support
1	Error-Code – Tx	11.2.10	m	
2	Display-String – Tx	11.2.1	m	

A.7.2.2.9.9 TEK Invalid parameters

Table A181—TEK Invalid parameters

Item	Capability	Reference	Status	Support
1	Key-Sequence-number –Tx	11.2.5	m	
2	SAID – Tx	11.2.7	m	
3	Error-Code – Tx	11.2.10	m	
4	Display-String – Tx	11.2.1	m	
5	HMAC-Digest – Tx	11.2.6	m	

A.7.2.2.9.10 Authentication Information parameters

Table A182—Authentication Information parameters

Item	Capability	Reference	Status	Support
1	CA-Certificate – Rx	11.2.11	m	

A.7.2.2.10 DSA-REQ

Table A183—DSA-REQ Message

Item	Capability	Reference	Status	Support
1	DSA-REQ – Rx	6.2.2.3.10	c1	
2	DSA-REQ – Tx	6.2.2.3.10	m	
3	Service Flow ID – Tx	11.4.8.1	m	
4	Transport CID – Tx	11.4.8.2	m	
5	Service class name – Tx	11.4.8.3	x	
6	Service Flow Error Encodings – Tx	11.4.8.4	x	
7	Errored Parameter – Tx	11.4.8.4	x	
8	Error Code – Tx	11.4.8.4	x	
9	Error Message – Tx	11.4.8.4	x	
10	QoS Parameter Set Type – Tx	11.4.8.5	m	
11	Traffic Priority – Tx	11.4.8.6	c2	
12	Maximum Sustained Traffic Rate – Tx	11.4.8.7	m	
13	Maximum Traffic Burst – Tx	11.4.8.8	m	
14	Minimum Reserved Traffic Rate – Tx	11.4.8.9	m	
15	Vendor Specific QoS Parameters – Tx	11.4.8.10	m	

Table A183—DSA-REQ Message

16	Service Flow Scheduling Type – Tx	11.4.8.11	m	
17	Request/Transmission Policy – Tx	11.4.8.12	m	
18	Tolerated Jitter – Tx	11.4.8.13	m	
19	Maximum Latency – Tx	11.4.8.14	m	
20	Fixed vs. Variable Length SDU Indicator – Tx	11.4.8.15	m	
21	SDU Size – Tx	11.4.8.16	c3	
22	Target SAID – Tx	11.4.8.17	m	
23	HMAC Tuple – Tx	11.4.10	m	
24	Vendor Specific Information – Tx	11.4.11	m	
25	Convergence Sublayer Specification – Tx	11.4.9.1	m	

c1: if (profM1 && Table A127/5) then m else x // only for SVCs and soft-PVCs
c2: if (Service Flow Scheduling Type = BE) then o// only for best effort services
else n/a
c3: if (profM1) then m else x

Table A184—DSA-REQ Message Packet CL Parameters

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	Packet Classification Rule – Tx	11.4.9.3	m	
2	Classifier Rule Priority – Tx	11.4.9.3	m	
3	IP Type of Service/DSCP – Tx	11.4.9.3	c1	
4	Protocol – Tx	11.4.9.3	c1	
5	IP Masked Source Address – Tx	11.4.9.3	c1	
6	IP Destination Address – Tx	11.4.9.3	c1	
7	Protocol Source Port Range – Tx	11.4.9.3	c1	
8	Protocol destination Port Range – Tx	11.4.9.3	c1	
9	Ethernet Destination MAC Address – Tx	11.4.9.3	c2	
10	Ethernet Source MAC Address – Tx	11.4.9.3	c2	
11	Ethertype/IEEE 802.2 SAP – Tx	11.4.9.3	c2	
12	IEEE 802.1D User_Priority – Tx	11.4.9.3	c3	

Table A184—DSA-REQ Message Packet CL Parameters

Prerequisite: profM2

13	IEEE 802.1Q VLAN_ID – Tx	11.4.9.3	c3	
14	Associated Payload Header Suppression Index – Tx	11.4.9.3	c4	
15	Vendor Specific Classifier Parameters – Tx	11.4.9.3	o	
16	Payload Header Suppression Rule – Tx	11.4.9.3	c4	
17	Payload Header Suppression Index – Tx	11.4.9.3	c4	
18	Payload Header Suppression Field – Tx	11.4.9.3	c4	
19	Payload Header Suppression Mask – Tx	11.4.9.3	c4	
20	Payload Header Suppression Size – Tx	11.4.9.3	c4	
21	Payload Header Suppression Verification – Tx	11.4.9.3	c4	
22	Vendor Specific PHS Parameters – Tx	11.4.9.3	c5	

c1: m for IPV4 services, if Table A128/2 or Table A128/6 or Table A128/8 then m for IPV6 services // IP
c2: If Table A128/3 then m else n/a // Ethernet
c3: If Table A128/4 then m else n/a // VLAN
c4: If Table A129/1 then m else n/a // PHS
c5: If Table A129/1 then o else n/a // PHS

Table A185—DSA-REQ Message ATM CL Parameters

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VPI – Tx	11.4.9.4	m	
2	VCI – Tx	11.4.9.4	m	
3	ATM Switching – Tx	11.4.9.4	m	

A.7.2.2.11 DSA-RSP

Table A186—DSA-RSP Message

Item	Capability	Reference	Status	Support
1	DSA-RSP – Rx	6.2.2.3.11	m	
2	DSA-RSP – Tx	6.2.2.3.11	c1	
3	Service Flow ID – Rx	11.4.8.1	n/a	
4	Transport CID – Rx	11.4.8.2	n/a	
5	Service class name – Rx	11.4.8.3	n/a	
6	Service Flow Error Encodings – Rx	11.4.8.4	m	
7	Errored Parameter – Rx	11.4.8.4	m	
8	Error Code – Rx	11.4.8.4	m	
9	Error Message – Rx	11.4.8.4	m	
10	QoS Parameter Set Type – Rx	11.4.8.56	n/a	
11	Traffic Priority – Rx	11.4.8.	n/a	
12	Maximum Sustained Traffic Rate – Rx	11.4.8.7	n/a	
13	Maximum Traffic Burst – Rx	11.4.8.8	n/a	
14	Minimum Reserved Traffic Rate – Rx	11.4.8.9	n/a	
15	Vendor Specific QoS Parameters – Rx	11.4.8.10	n/a	
16	Service Flow Scheduling Type – Rx	11.4.8.11	n/a	
17	Request/Transmission Policy – Rx	11.4.8.12	n/a	
18	Tolerated Jitter – Rx	11.4.8.13	n/a	
19	Maximum Latency – Rx	11.4.8.14	n/a	
20	Fixed vs. Variable Length SDU Indicator – Rx	11.4.8.15	n/a	
21	SDU Size – Rx	11.4.8.16	n/a	
22	Target SAID – Rx	11.4.8.17	n/a	
23	HMAC Tuple –Rx	11.4.10	m	
24	Vendor Specific Information – Rx	11.4.11	n/a	
25	Convergence Sublayer Specification	11.4.9.1	n/a	

c1: if (profM1 && Table A3/5) then m else x // only for SVCs and soft-PVCs

Table A187—DSA-RSP Message Packet CL Parameters

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	Classifier Error Parameter Set – Rx	11.4.9.3	m	
2	Errored parameter (classifier) – Rx	11.4.9.3	m	
3	Error Code (classifier) – Rx	11.4.9.3	m	
4	Error Message (classifier) – Rx	11.4.9.3	o	
5	PHS Error Parameter Set – Rx	11.4.9.3	m	
6	Errored parameter (PHS) – Rx	11.4.9.3	c1	
7	Error Code (PHS) – Rx	11.4.9.3	m	
8	Error Message (PHS) – Rx	11.4.9.3	c1	

c1: If Table A129/1 then m else n/a // PHS

Table A188—DSA-RSP Message ATM CL Parameters

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VPI – Rx	11.4.9.4	n/a	
2	VCI – Rx	11.4.9.4	n/a	
3	ATM Switching – Rx	11.4.9.4	n/a	

A.7.2.2.12 DSA-ACK

Table A189—DSA-ACK Message

Item	Capability	Reference	Status	Support
1	DSA-ACK – Rx	6.2.2.3.12	c1	
2	DSA-ACK – Tx	6.2.2.3.12	m	
6	Service Flow Error Encodings – Tx	11.4.8.4	x	
7	Errored Parameter – Tx	11.4.8.4	x	
8	Error Code – Tx	11.4.8.4	x	
9	Error Message – Tx	11.4.8.4	x	
10	HMAC Tuple –Tx	11.4.10	m	

c1: if (profM1 && Table A127/5) then m else x // only for SVCs and soft-PVCs

A.7.2.2.13 DSC-REQ

Table A190—DSC-REQ Message

Item	Capability	Reference	Status	Support
1	DSC-REQ – Rx	6.2.2.3.13	c1	
2	DSC-REQ – Tx	6.2.2.3.13	m	
3	Service Flow ID – Tx	11.4.8.1	m	
4	Transport CID – Tx	11.4.8.2	m	
5	Service class name – Tx	11.4.8.3	x	
6	Service Flow Error Encodings – Tx	11.4.8.4	x	
7	Errored Parameter – Tx	11.4.8.4	x	
8	Error Code – Tx	11.4.8.4	x	
9	Error Message – Tx	11.4.8.4	x	
10	QoS Parameter Set Type – Tx	11.4.8.5	m	
11	Traffic Priority – Tx	11.4.8.6	c2	
12	Maximum Sustained Traffic Rate – Tx	11.4.8.7	m	
13	Maximum Traffic Burst – Tx	11.4.8.8	m	
14	Minimum Reserved Traffic Rate – Tx	11.4.8.9	m	
15	Vendor Specific QoS Parameters – Tx	11.4.8.10	m	

Table A190—DSC-REQ Message

16	Service Flow Scheduling Type – Tx	11.4.8.11	m	
17	Request/Transmission Policy – Tx	11.4.8.12	x	
18	Tolerated Jitter – Tx	11.4.8.13	m	
19	Maximum Latency – Tx	11.4.8.14	m	
20	Fixed vs. Variable Length SDU Indicator – Tx	11.4.8.15	x	
21	SDU Size – Tx	11.4.8.16	x	
22	Target SAID – Tx	11.4.8.17	m	
23	HMAC Tuple – Tx	11.4.10	m	
24	Vendor Specific Information – Tx	11.4.11	m	
25	Convergence Sublayer Specification	11.4.9.1	x	

c1: if (profM1 && Table A127/5) then m else x // only for SVCs and soft-PVCs
c2: if (Service Flow Scheduling Type = BE) then o// only for best effort services
else n/a

Table A191—DSC-REQ Message Packet CL Parameters

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	Classifier Change Action	11.4.9.3	m	
2	Packet Classification Rule – Tx	11.4.9.3	m	
3	Classifier Rule Priority – Tx	11.4.9.3	m	
4	IP Type of Service/DSCP – Tx	11.4.9.3	c1	
5	Protocol – Tx	11.4.9.3	c1	
6	IP Masked Source Address – Tx	11.4.9.3	c1	
7	IP Destination Address – Tx	11.4.9.3	c1	
8	Protocol Source Port Range – Tx	11.4.9.3	c1	
9	Protocol destination Port Range – Tx	11.4.9.3	c1	
10	Ethernet Destination MAC Address – Tx	11.4.9.3	c2	
11	Ethernet Source MAC Address – Tx	11.4.9.3	c2	
12	Ethertype/IEEE 802.2 SAP – Tx	11.4.9.3	c2	
13	IEEE 802.1D User_Priority – Tx	11.4.9.3	c3	
14	IEEE 802.1Q VLAN_ID – Tx	11.4.9.3	c3	
15	Associated Payload Header Suppression Index – Tx	11.4.9.3	c4	

Table A191—DSC-REQ Message Packet CL Parameters

Prerequisite: profM2

16	Vendor Specific Classifier Parameters – Tx	11.4.9.3	o	
17	PHS Change Action	11.4.9.3	c4	
18	Payload Header Suppression Rule – Tx	11.4.9.3	c4	
19	Payload Header Suppression Index – Tx	11.4.9.3	c4	
20	Payload Header Suppression Field – Tx	11.4.9.3	c4	
21	Payload Header Suppression Mask – Tx	11.4.9.3	c4	
22	Payload Header Suppression Size – Tx	11.4.9.3	c4	
23	Payload Header Suppression Verification – Tx	11.4.9.3	c4	
24	Vendor Specific PHS Parameters – Tx	11.4.9.3	c5	
25	Dynamic Service Change Action (Classifiers) – Tx	11.4.9.3	m	
26	Dynamic Service Change Action (PHS Rules) – Tx	11.4.9.3	c4	

c1: m for IPV4 services, if Packet Convergence Sublayer Protocol Support/2 or Packet Convergence Sublayer Protocol Support/6 or Packet Convergence Sublayer Protocol Support/8 then m for IPV6 services // IP
c2: If Packet Convergence Sublayer Protocol Support/3 then m else n/a// Ethernet
c3: If Packet Convergence Sublayer Protocol Support/4 then m else n/a// VLAN
c4: If BS Packet Convergence Sublayer Capabilities/1 then m else n/a// PHS
c5: If BS Packet Convergence Sublayer Capabilities/1 then o else n/a// PHS

Table A192—DSC-REQ Message ATM CL Parameters

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VPI – Tx	11.4.9.4	m	
2	VCI – Tx	11.4.9.4	m	
3	ATM Switching – Tx	11.4.9.4	x	

A.7.2.2.14 DSC-RSP

Table A193—DSC-RSP Message

Item	Capability	Reference	Status	Support
1	DSC-RSP – Rx	6.2.2.3.14	m	
2	DSC-RSP – Tx	6.2.2.3.14	c1	
3	Service Flow ID – Rx	11.4.8.1	n/a	
4	Transport CID – Rx	11.4.8.2	n/a	
5	Service class name – Rx	11.4.8.3	n/a	
6	Service Flow Error Encodings – Rx	11.4.8.4	m	
7	Errored Parameter – Rx	11.4.8.4	m	
8	Error Code – Rx	11.4.8.4	m	
9	Error Message – Rx	11.4.8.4	m	
10	QoS Parameter Set Type – Rx	11.4.8.5	n/a	
11	Traffic Priority – Rx	11.4.8.6	n/a	
12	Maximum Sustained Traffic Rate – Rx	11.4.8.7	n/a	
13	Maximum Traffic Burst – Rx	11.4.8.8	n/a	
14	Minimum Reserved Traffic Rate – Rx	11.4.8.9	n/a	
15	Vendor Specific QoS Parameters – Rx	11.4.8.10	n/a	
16	Service Flow Scheduling Type – Rx	11.4.8.11	n/a	
17	Request/Transmission Policy – Rx	11.4.8.12	n/a	
18	Tolerated Jitter – Rx	11.4.8.13	n/a	
19	Maximum Latency – Rx	11.4.8.14	n/a	
20	Fixed vs. Variable Length SDU Indicator – Rx	11.4.8.15	n/a	
21	SDU Size – Rx	11.4.8.16	n/a	
22	Target SAID – Rx	11.4.8.17	n/a	
23	HMAC Tuple –Rx	11.4.10	m	
24	Vendor Specific Information – Rx	11.4.11	n/a	
25	Convergence Sublayer Specification	11.4.9.1	n/a	

c1: if (profM1 && Table A127/5) then m else x // only for SVCs and soft-PVCs

Table A194—DSC-RSP Message Packet CL Parameters

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	Classifier Error Parameter Set – Rx	11.4.9.3	m	
2	Errored parameter (classifier) – Rx	11.4.9.3	m	
3	Error Code (classifier) – Rx	11.4.9.3	m	
4	Error Message (classifier) – Rx	11.4.9.3	o	
5	PHS Error Parameter Set – Rx	11.4.9.3	m	
6	Errored parameter (PHS) – Rx	11.4.9.3	c1	
7	Error Code (PHS) – Rx	11.4.9.3	m	
8	Error Message (PHS) – Rx	11.4.9.3	c1	

c1: If Table A129/1 then m else n/a // PHS

Table A195—DSC-RSP Message ATM CL Parameters

Prerequisite: profM1

Item	Capability	Reference	Status	Support
1	VPI – Rx	11.4.9.4	n/a	
2	VCI – Rx	11.4.9.4	n/a	
3	ATM Switching – Rx	11.4.9.4	n/a	

A.7.2.2.15 DSC-ACK

Table A196—DSC-ACK Message

Item	Capability	Reference	Status	Support
1	DSC-ACK – Rx	6.2.2.3.15	c1	
2	DSC-ACK – Tx	6.2.2.3.15	m	
6	Service Flow Error Encodings – Tx	11.4.8.4	x	
7	Errored Parameter – Tx	11.4.8.4	x	
8	Error Code – Tx	11.4.8.4	x	
9	Error Message – Tx	11.4.8.4	x	
23	HMAC Tuple –Tx	11.4.10	m	

c1: if (profM1 && Table A127/5) then m else n/a // only for SVCs and soft-PVCs

A.7.2.2.16 DSD-REQ

Table A197—DSD-REQ Message

Item	Capability	Reference	Status	Support
1	DSD-REQ – Rx	6.2.2.3.16	c1	
2	DSD-REQ – Tx	6.2.2.3.16	m	
3	HMAC Tuple – Tx	11.4.10	m	

c1: if (profM1 && Table A127/5) then m else x // only for SVCs and soft-PVCs

A.7.2.2.17 DSD-RSP

Table A198—DSD-RSP Message

Item	Capability	Reference	Status	Support
1	DSD-RSP – Rx	6.2.2.3.17	m	
2	DSD-RSP – Tx	6.2.2.3.17	c1	
3	HMAC Tuple – Rx	11.4.10	m	

c1: if (profM1 && Table A127/5) then m else x // only for SVCs and soft-PVCs

A.7.2.2.18 MCA-REQ

Table A199—MCA-REQ Message

Item	Capability	Reference	Status	Support
1	MCA-REQ – Rx	6.2.2.3.18	n/a	
2	MCA-REQ – Tx	6.2.2.3.18	c1	
3	Multicast CID – Tx	11.1.5	c1	
4	Assignment –Tx	11.1.5	c1	

c1: If Multicast Polling Groups – BS/1 then m else x

A.7.2.2.19 MCA-RSP

Table A200—MCA-RSP Message

Item	Capability	Reference	Status	Support
1	MCA-RSP – Rx	6.2.2.3.19	m	
2	MCA-RSP – Tx	6.2.2.3.19	x	

A.7.2.2.20 DBPC-REQ

Table A201—DBPC-REQ Message

Item	Capability	Reference	Status	Support
1	DBPC-REQ – Rx	6.2.2.3.20	m	
2	DBPC-REQ – Tx	6.2.2.3.20	x	

A.7.2.2.21 DBPC-RSP

Table A202—DBPC-RSP Message

Item	Capability	Reference	Status	Support
1	DBPC-RSP – Rx	6.2.2.3.21	n/a	
2	DBPC-RSP – Tx	6.2.2.3.21	m	

A.7.2.2.22 RES-CMD

Table A203—RES-CMD Message

Item	Capability	Reference	Status	Support
1	RES-CMD – Rx	6.2.2.3.22	n/a	
2	RES-CMD – Tx	6.2.2.3.22	m	
3	HMAC Tuple – Tx	11.4.10	m	

A.7.2.2.23 SBC-REQ

Table A204—SBC-REQ Message

Item	Capability	Reference	Status	Support
1	SBC-REQ – Rx	6.2.2.3.23	m	
2	SBC-REQ – Tx	6.2.2.3.23	x	
3	10-66 GHz PHY SS Demod Support – Rx	11.4.1.2	m	
4	10-66 GHz PHY SS Modulator Support – Rx	11.4.1.2	m	
5	10-66 GHz PHY SS DL FEC Types – Rx	11.4.1.2	m	
6	10-66 GHz PHY SS UL FEC Types – Rx	11.4.1.2	m	
7	BW Allocation Support – Rx	11.4.1.6	m	

A.7.2.2.24 SBC-RSP

Table A205—SBC-RSP Message

Item	Capability	Reference	Status	Support
1	SBC-RSP – Rx	6.2.2.3.24	n/a	
2	SBC-RSP – Tx	6.2.2.3.24	m	
3	10-66 GHz PHY SS Demod Support – Tx	11.4.1.2	m	
4	10-66 GHz PHY SS Modulator Support – Tx	11.4.1.2	m	
5	10-66 GHz PHY SS DL FEC Types – Tx	11.4.1.2	m	
6	10-66 GHz PHY SS UL FEC Types – Tx	11.4.1.2	m	
7	BW Allocation Support – Tx	11.4.1.6	m	

A.7.2.2.25 CLK-CMP

Table A206—CLK-CMP Message

Item	Capability	Reference	Status	Support
1	CLK-CMP – Rx	6.2.2.3.25	n/a	
2	CLK-CMP – Tx	6.2.2.3.25	m	

A.7.2.2.26 DREG-CMD

Table A207—DREG-CMD Message

Item	Capability	Reference	Status	Support
1	DREG-CMD – Rx	6.2.2.3.26	n/a	
2	DREG-CMD – Tx	6.2.2.3.26	m	
3	HMAC Tuple – Tx	11.4.10	m	

A.7.2.2.27 DSX-RVD

Table A208—DSX-RVD Message

Item	Capability	Reference	Status	Support
1	DSX-RVD – Rx	6.2.2.3.27	n/a	
2	DSX-RVD – Tx	6.2.2.3.27	c1	

c1: If ATM Convergence Sublayer Capabilities/5 then m else x

A.7.2.2.28 TFTP-CPLT

Table A209—TFTP-CLPT Message

Item	Capability	Reference	Status	Support
1	TFTP-CPLT – Rx	6.2.2.3.28	m	
2	TFTP-CPLT – Tx	6.2.2.3.28	x	
3	HMAC Tuple – Rx	11.4.10	m	

A.7.2.3 TFTP-RSP

Table A210—TFTP-RSP Message

Item	Capability	Reference	Status	Support
1	TFTP-RSP – Rx	6.2.2.3.29	n/a	
2	TFTP-RSP – Tx	6.2.2.3.29	m	

A.7.2.4 ATM CS PDUs

Table A211—ATM CS PDUs

Prerequisite profM1

Item	Capability	Reference	Status	Support
1	CS PDU for ATM connections with no PHS	5.1.2.1	m	
2	CS PDU for VP-switched ATM connections with PHS	5.1.2.1 & 5.1.2.3	m	
3	CS PDU for VC-switched ATM connections with PHS	5.1.2.1 & 5.1.2.3	m	

A.7.2.5 Packet CS PDUs

Table A212—Packet CS PDUs

Prerequisite: profM2

Item	Capability	Reference	Status	Support
1	PDU on transport connection	5.2.1	m	

A.7.3 PDU parameters

This subclause covers the requirements of sections 10 and 11 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.7.3.1 Parameters and Constants

This subclause covers the requirements of section 10 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.7.3.1.1 Global Values

Table A213—BS Global Parameters Remote Support

Item	Capability	Reference	Status	Support
1	Provide at least 16 invited ranging retry opportunities	10.1	m	
2	Send RNG-RSP within 200 ms of receiving RNG-REQ	10.1	m	
3	Send REG-RSP within 3 s of receiving REG-REQ	10.1	m	
4	Send DSx-RSP within 1 s	10.1	m	
5	Send DSx-ACK within 300 ms of receiving DSx-RSP	10.1	m	
6	Send DSX-RVD within 200 ms of receiving DSx-REQ	10.1	m	

Table A214—BS Global Parameters Local Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	DL-MAP Interval	10.1	m		c1	
2	DCD Interval	10.1	m		10 ms .. 10 s	
3	UCD Interval	10.1	m		10 ms .. 10 s	
4	DCD Transition	10.1	m		>= 2 ms	
5	UCD Transition	10.1	m		>= 2 ms	
6	Max Map Pending	10.1	m		c2	
7	Initial Ranging Interval	10.1	m		< 2 s	
8	CLK-CMP Interval	10.1	m		50 ms	
9	Registration Response Retries	10.1	m		3	
10	UL-MAP Processing Time (Map Relevance)	10.1	m		200 us .. 1 ms	
11	SS Ranging Response Time	10.1	m		>= 1 ms	
12	Mini-slot size	10.1	m		c3	
13	DSx Request Retries	10.1	m		3	

Table A214—BS Global Parameters Local Support

14	DSx Response Retries	10.1	m		3	
15	TFTP Backoff Start	10.1	m		>= 1 s	
16	TFTP Backoff End	10.1	m		>= 16 s	
17	T3	10.1	m		200 ms	
18	T5	10.1	c4		2s	
19	T7	10.1	m		1s	
20	T8	10.1	m		300 ms	
21	T9	10.1	m		300 ms	
22	T10	10.1	m		3s	
23	T13	10.1	m		15 min	

c1: If (profP1 or profP2) then 1 ms else TBD.
c2: If (profM1) then 1595 else if (profM2) then 1295 else 4096.
c3: If (profP1 or profP2) then 2 else TBD.
c4: If (profP1 or profP2) then n/a else m.

A.7.3.1.2 PKM Parameter Values

Table A215—BS PKM Parameters Local Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	AK Lifetime	10.2	m		c1	
2	TEK Lifetime	10.2	m		c2	

c1: if (test mode) then 5 min else 1 day..70 days
c2: if (test mode) then 3 min else 30 min..7 days

A.7.3.1.3 10-66 GHz PHY Specific Values

Table A216—BS PHY-Specific Parameters Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Physical Slot	10.3	m		4 QAM symbols	
2	Symbol Rate	10.3	m		c1	
3	UL center frequency	10.3	m		Multiple of 250 kHz within frequency band of operation	

c1: if (profP1) then 20 mbaud else if (profP2) then 22.4 mbaud

A.7.3.1.4 Well Known Addresses and Identifiers

Table A217—BS Well Known CIDs

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Initial Ranging CID	10.4	m		0x0000	
2	Basic CIDs	10.4	m		0x0001..J	
3	Primary Management CIDs	10.4	m		J+1..K	
4	Transport and Secondary Management CIDs	10.4	m		K+1.. 0xFEFF	
5	Multicast Polling CIDs	10.4	c1		0xFF00 .. 0xFFFE	
6	Broadcast CID	10.4	m		0xFFFF	

c1: if (Table A137/11) then m else n/a

A.7.3.2 MAC Management Message Encodings

A.7.3.2.1 UCD Message Encodings

Table A218—BS UCD Channel Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Burst descriptor	11.1.1.1	m		See Table A219	
2	Symbol Rate	11.1.1.1	c1		c1	
3	Frequency	11.1.1.1	c1		c1	
4	SS transition Gap	11.1.1.1	m		>= 6 PS	
5	Roll-off Factor	11.1.1.1	c1		0.25	
6	Power Adjustment Rule	11.1.1.1	m		0..1	
7	Random Access Time-out	11.1.1.1	m		>0	

c1: if (profP1 || profP2) then x

Table A219—BS UCD Burst Profile Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Modulation Type	11.1.1.2	m		1..3	
2	Preamble Length	11.1.1.2	m		16, 32	
3	FEC Code Type	11.1.1.2	m		1..3	
4	RS Information Bytes	11.1.1.2	m		6..255	
5	RS parity bytes	11.1.1.2	m		0-32	
6	BCC Code Type	11.1.1.2	m		1	
7	BTC Row Code Type	11.1.1.2	x			
8	BTC Column Type	11.1.1.2	x			
9	BTC Interleaving Type	11.1.1.2	x			
10	Scrambler Seed	11.1.1.2	m			
11	Last Codeword Length	11.1.1.2	m		c1	

c1: if (FEC Code Type = 1) then 1 else 2

A.7.3.2.2 DCD Message Encodings

Table A220—BS DCD Channel Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Burst descriptor	11.1.2.1	m		See Table A221	
2	BS Transmit Power	11.1.2.1	m			
3	Frame Duration	11.1.2.1	x			
4	Downlink PHY Type	11.1.2.1	m		c1	
5	Power Adjustment Rule	11.1.2.1	m		0..1	

c1: If (profP1t || profP2t) then 0
else if (profP2f || profP2f) then 1

Table A221—BS DCD Burst Profile Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Modulation Type	11.1.2.2	m		1..3	
2	FEC Code Type	11.1.2.2	m		1..3	
3	RS Information Bytes	11.1.2.2	m		6..255	
4	RS parity bytes	11.1.2.2	m		0-32	
5	BCC Code Type	11.1.2.2	m		1	
6	BTC Code Type	11.1.2.2	x			
7	BTC Row Code Type	11.1.2.2	x			
8	BTC Column Type	11.1.2.2	x			
9	BTC Interleaving Type	11.1.2.2	x			
10	Last Codeword Length	11.1.2.2	m		c1	
11	DIUC Mandatory exit Threshold	11.1.2.2	m			
12	DIUC minimum entry Threshold	11.1.2.2	m			
13	Preamble present	11.1.2.2	m		0..1	

c1: if (FEC Code Type = 1) then 1 else 2

A.7.3.2.3 RNG-REQ Message Encodings

Table A222—BS RNG-REQ Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Requested Downlink Burst Type	11.1.3	m		0..12	
2	SS MAC Address	11.1.3	m			
3	Ranging Anomalies	11.1.3	m		[0,1,2,4,5,6]	

A.7.3.2.4 RNG-RSP Message Encodings

Table A223—BS RNG-RSP Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Timing Adjust	11.1.3	m			
2	Power Level Adjust	11.1.3	m			
3	Offset Frequency Adjust	11.1.3	x			
4	Ranging status	11.1.3	m		1..4	
5	Downlink Frequency over-ride	11.1.3	m			
6	Uplink Channel ID Override	11.1.3	x			
7	Downlink operational burst profile	11.1.3	m		0..12	
8	SS MAC Address	11.1.3	m			
9	Basic CID	11.1.3	m		0x0001 .. m	
10	Primary Management CID	11.1.3	m		m+1 .. 2m	

A.7.3.2.5 MCA-REQ Message Encodings

Table A224—BS MCA-REQ Encodings Support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Multicast polling CID	11.1.5	c1		0xFF00 .. 0xFFFE	
2	Assignment	11.1.5	c1		0..1	

c1: If Multicast Polling Groups – BS/1 then m else n/a

A.7.3.3 PKM Message Encodings

Table A225—PKM Message Encodings support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Display-string	11.2.1	o			
2	AUTH-Key	11.2.2	m			
3	TEK	11.2.3	m			
4	Key-Lifetime	11.2.4	m			
5	Key-Sequence-Number	11.2.5	m		AK:0-15 TEK:0-3	
6	HMAC-Digest	11.2.6	m			
7	SAID	11.2.7	m			
8	TEK-Parameters	11.2.8	m			
9	CBC-IV	11.2.9	m			

Table A225—PKM Message Encodings support

10	Error-Code	11.2.10	m		0-6	
11	CA-Certificate	11.2.11	m			
12	SS-Certificate	11.2.12	m			
13	Security-Capabilities	11.2.13	m			
14	Cryptographic-Suite	11.2.14	m		0x000001 0x010001	
15	Cryptographic-Suite-List	11.2.15	m			
16	Version	11.2.16	m		1	
17	SA-Descriptor	11.2.17	m			
18	SA-Type	11.2.18	m		0,1,2	
19	PKM Configuration Setting	11.2.19	m			

Table A226—PKM Configuration Settings support

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Authorize Wait Timeout	11.2.19	m		2-30s	
2	Reauthorize Wait Timeout	11.2.19	m		2-30s	
3	Authorization Grace Time	11.2.19	m		60s, 300 – 3024000s	
4	Operational Wait Timeout	11.2.19	m		1-10s	
5	Rekey Wait Timeout	11.2.19	m		1-10s	
6	TEK Grace Time	11.2.19	m		60s, 300 – 3023999s	
7	Authorize Reject Wait Time-out	11.2.19	m			

A.7.3.4 Common Encodings

This subclause covers the requirements of section 11.4 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A227—Common Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	SS Capabilities Encodings	11.4.1	m			
2	SS Message Integrity Check	11.4.2	m			
3	Vendor ID Encoding	11.4.3	m			
4	MAC Version Encoding	11.4.4	m			
5	Convergence sublayer Capabilities	11.4.5	m			
6	TFTP Server Timestamp	11.4.6	m			
7	TFTP Server Provisioned SS Address	11.4.7	m			
8	Service Flow Encodings	11.4.8	m			
9	Convergence Sublayer Specific Flow Encodings	11.4.9	m			
10	HMAC Tuple	11.4.10	m			
11	Vendor Specific Information	11.4.11	m			
12	Confirmation Code	11.4.12	m			

A.7.3.4.1 SS Capabilities Encodings

This subclause covers the requirements of section 11.4.1 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A228—SS Capabilities Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Uplink CID support	11.4.1.1	m		>= 3	
2	Physical parameter support	11.4.1.2	m			
3	PKM Flow Control	11.4.1.3	m		0-255	
4	DSx Flow Control	11.4.1.4	m		0-255	
5	MCA Flow Control	11.4.1.5	m		0-255	
6	Bandwidth allocation support	11.4.1.6	m		0x01, 0x03	
7	IP Version	11.4.1.7	m		0x01, 0x03	
8	MAC CRC Support	11.4.1.8	m		0, 1	
9	Multicast Polling Group CID Support	11.4.1.9	c1		>= 4	

c1: If Multicast Polling Groups – BS/1 then m else n/a

A.7.3.4.1.1 SS PHY Parameter Encodings

Table A229—SS PHY Parameter Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
2	10-66 GHz PHY SS Demodulator Types	11.4.1.2.1	m		0x03, 0x07	
3	10-66 GHz PHY SS Modulator Types	11.4.1.2.2	m		0x01, 0x03, 0x07	
4	10-66 GHz SS Downlink FEC Types	11.4.1.2.3	m		0x03, 0x07	
5	10-66 GHz SS Uplink FEC Types	11.4.1.2.4	m		0x03, 0x07	

A.7.3.4.2 Convergence Sublayer Capabilities Encodings

This subclause covers the requirements of section 11.4.5 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A230—Convergence Sublayer Capabilities Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Convergence Sublayer Support	11.4.5.1	m		1-511	
2	Maximum Number of Classifier	11.4.5.2	m		0-(2^{16}-1)	
3	Payload Header Suppression Support	11.4.5.3	m		0,1,2	

A.7.3.4.3 Service Flow Encodings

This subclause covers the requirements of section 11.4.8 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A231—Service Flow Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Service Flow ID	11.4.8.1	m		1 – 4294967295	
2	Connection Identifier	11.4.8.2	m		2049 – 65279 (assumes m=1024)	
3	Service Class Name	11.4.8.3	x			
4	Service Flow Error Parameter Set	11.4.8.4	m			
5	Quality of Service Parameter Set Type	11.4.8.5	m		0x00 – 0x07	
6	Traffic Priority	11.4.8.6	m		0-7	
7	Maximum Sustained Traffic Rate	11.4.8.7	m		0-(2^{32}-1)	

Table A231—Service Flow Encodings

8	Maximum Traffic Burst	11.4.8.8	m		0-(2^{32}-1)	
9	Minimum Reserved Traffic Rate	11.4.8.9	m		0-(2^{32}-1)	
10	Vendor Specific QoS Parameters	11.4.8.10	m			
11	Service Flow Scheduling Type	11.4.8.11	m		2-4, 6	
12	Request Transmission Policy	11.4.8.12	m		Bit 0: 0,1 Bit 2: 0,1 Bit 3: 0,1 Bit 4: 0,1 Bit 5: 0,1 Bit 6: 0,1	Bit 0: Bit 2: Bit 3: Bit 4: Bit 5: Bit 6:
13	Tolerated Jitter	11.4.8.13	m		>= 1 ms	
14	Maximum Latency	11.4.8.14	n/a		n/a	
15	Fixed-Length vs. Variable Length PDU Indicator	11.4.8.15	m		0, 1	
16	SDU Size	11.4.8.16	c1		49, 51, 52	
17	Target SAID	11.4.8.17	m			

c1: If profM1 then m else n/a

A.7.3.4.3.1 Service Flow Error Parameters

Table A232—Service Flow Error Parameters

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Errored Parameter	11.4.8.4	m			
2	Error Code	11.4.8.4	m		1-14	
3	Error Message	11.4.8.4	o			

A.7.3.4.4 Convergence Sublayer Specific Service Flow Encodings

This subclause covers the requirements of section 11.4.9 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A233—Convergence Sublayer Specific Service Flow Encodings

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Convergence Sublayer Specification	11.4.9.1	m		0-8	
2	Convergence Sublayer Parameter Encoding Rules	11.4.9.2	m			
3	Packet CS Encodings for Configuration and MAC Layer Messaging	11.4.9.3	c1			
4	ATM CS Encodings for Configuration and MAC Layer Messaging	11.4.9.4	c2			

c1: if profM2 then m else n/a
c2: if profM1 then m else n/a

A.7.3.4.4.1 Packet CS Encodings

This subclause covers the requirements of section 11.4.9.3 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A234—Packet CS Encodings

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Dynamic Service Change Action	11.4.9.3	m		0, 1, 2	
2	Classifier Error Parameter Set	11.4.9.3	m			
2	Packet Classification Rule	11.4.9.3	m			
3	Payload Header Suppression Rule	11.4.9.3	m			

A.7.3.4.4.1.1 Classifier Error Parameter Set

Table A235—Classifier Error Parameters Set Parameters

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Errored Parameter	11.4.9.3	m			
2	Error Code	11.4.9.3	m		1-6, 8-13	
4	Error Message	11.4.9.3	m			

A.7.3.4.4.1.2 Packet Classification Rule Parameters

Table A236—Packet Classification Rule Parameters

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Classifier Rule Priority	11.4.9.3	m		0-255	
2	IP TOS/DSCP Range and Mask	11.4.9.3	c1			
3	Protocol	11.4.9.3	c1			
4	IP masked source address	11.4.9.3	c1			
5	IP Destination Address	11.4.9.3	c1			
6	Protocol Source Port Range	11.4.9.3	c1			
7	Protocol Destination Port Range	11.4.9.3	c1			
8	Ethernet Destination MAC Address	11.4.9.3	c2			
9	Ethernet Source MAC address	11.4.9.3	c2			

Table A236—Packet Classification Rule Parameters

Prerequisite profM2

10	Ethertype/IEEE 802.2 SAP	11.4.9.3	c2			
11	IEEE 802.1D User Priority	11.4.9.3	c3			
12	IEEE 802.1Q VLAN_ID	11.4.9.3	c3			
13	Associated Payload Header Suppression Index	11.4.9.3	m		0-255	
14	Vendor Specific Classifier Parameters	11.4.9.3	m			
15	Dynamic Service Change Action	11.4.9.3	m			
16	PHS Error Parameter Set	11.4.9.3	c4			
17	Errored Parameter	11.4.9.3	c4			
18	Error Code	11.4.9.3	c4			
19	Error Message	11.4.9.3	c4			

c1: Table A128/(1, 2, 5, 6, 7, or 8) then m else n/a \\ IP
c2: If Table A128/(3, 4, 5, 6, 7, or 8) then m else n/a \\ Ethernet
c3: If Table A128/(4, 7, or 8) then m else n/a \\ VLAN
c4: If Table A129/1 then m else n/a\\ PHS

A.7.3.4.4.1.3 Payload Header Suppression Rule Parameter Set

Table A237—Classifier Error Parameters Set Parameters

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	PHSI	11.4.9.3	m		1-255	
2	PHSF	11.4.9.3	m			
3	PHSM	11.4.9.3	m			
4	PHSS	11.4.9.3	m			
5	PHSV	11.4.9.3	m		0, 1	
6	Vendor Specific	11.4.9.3	m			

A.7.3.4.4.2 ATM CS Encodings

This subclause covers the requirements of section 11.4.9.4 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A238—ATM CS Encodings

Prerequisite profM1

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	ATM Switching Encodings	11.4.9.4	m		0, 1, 2	
2	VPI Classifier	11.4.9.4	m		0x00XX	
3	VCI Classification	11.4.9.4	m			

A.7.4 Major BS Capabilities and Functionalities of the PHY

This subclause covers the requirements of sections 10 and 11 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

A.7.4.1 Multiplexing and Multiple Access Schemes

This subclause covers the requirements of section 8.2 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A239—Multiplexing and Multiple Access - BS

Item	Capability	Reference	Status	Support
1	Framed FDD	8.2.4.1	c1	
2	Support Full Duplex FDD terminals	8.2.4.1	c1	
3	Support Half-Duplex FDD terminals	8.2.4.1	c1	
4	TDD	8.2.4.2	c2	

Table A239—Multiplexing and Multiple Access - BS

5	Tx/Rx Transition Gap	8.2.2.1.2.1	c2	
6	Rx/Tx Transition Gap	8.2.5	c2	
7	Downlink - Generate TDM portion of burst	8.2.5	m	
8	Downlink - Generate TDMA portion of burst	8.2.6	c1	
9	Uplink Burst Subframe Structure – support contention slots for initial access	8.2.6	m	
10	Uplink Burst Subframe Structure – support contention slots for bandwidth request	8.2.6	m	
11	Uplink Burst Subframe Structure – support scheduled slots	8.2.6	m	
12	Uplink Burst Profile Modes	8.2.6	m	
13	DL frequency < UL Frequency unless otherwise required by regulators.		c3	
14	For an instance of a TDD channel or an instance of an FDD UL/DL pair, UL and DL shall use the same polarization.		m	

c1: If (profP1f or profP2f) then m else n/a
c2: If (profP1t or profP2t) then m else n/a
c3: If Table A239/1 then m else n/a

A.7.4.2 Downlink Physical layer

This subclause covers the requirements of section 8.2.5 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A240—Downlink Physical Layer - BS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Control portion	8.2.5	m			
2	TC sublayer	8.2.5	m			
3	Randomization	8.2.5	m			
4	RS outer code – frame control	8.2.5	m		T=10	
5	RS outer code – other bursts	8.2.5	m		t=0 t=4 t=8 t=12	
6	RS outer code – other bursts	8.2.5	o		t=0-16	
7	Fixed codeword operation	8.2.5	m			
8	Shortened last codeword operation	8.2.5	m			
9	BCC inner code	8.2.5	m			
10	Parity check inner code	8.2.5	o			
11	Block Turbo code	8.2.5	x			
12	Frame preamble	8.2.5	m		32 sym	
13	Burst preamble	8.2.5	c1		16 sym	
14	Gray coded constellation mapping	8.2.5	m			
15	QPSK	8.2.5	m			
16	16-QAM	8.2.5	m			
17	64-QAM	8.2.5	o			
18	Baseband pulse shaping roll-off = 0.25	8.2.5	m			
20	Transmitted waveform	8.2.5	m			
21	RS Outer Code – Information Block Length	8.2.5	m		6..255	
22	Power Adjustment Rule – Peak Power	8.2.5	m			
23	Power Adjustment Rule – Average Power	8.2.5	o			

c1: if (ProfP1f or ProfP2f) then m else n/a// burst preamble allowed only for FDD

A.7.4.3 Uplink Physical Layer

This subclause covers the requirements of section 8.2.6 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A241—Uplink Physical Layer - BS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	TC sublayer	8.2.6	m			
2	Randomization with programmable seed	8.2.6	m			
3	RS outer code – initial ranging	8.2.6	m		T=10	
4	RS outer code – other bursts	8.2.6	m		t=0 t=4 t=8 t=12	
5	RS outer code – other bursts	8.2.6	o		t=0-16	
6	Fixed codeword operation	8.2.6	m			
7	Shortened last codeword operation	8.2.6	m			
8	BCC inner code	8.2.6	m			
9	Parity check inner code	8.2.6	o			
10	Block Turbo code	8.2.6	x			
11	Burst preamble	8.2.6	m		16 or 32 symbols	
12	Gray coded constellation mapping	8.2.6	m			
13	QPSK	8.2.6	m			
14	16-QAM	8.2.6	o			
15	64-QAM	8.2.6	o			
16	RS Outer Code – Information Block Length	8.2.6	m		6..255	
17	Power Adjustment Rule – Peak Power	8.2.6	m			
18	Power Adjustment Rule – Average Power	8.2.6	o			

A.7.4.4 Baud Rates and Channel Widths

This subclause covers the requirements of section 8.2.7 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A242—Baud Rates and Channel Widths - BS

Item	Capability	Reference	Status	Support
1	Implement 20 Mbaud symbol rate	8.2.7	c1	
2	Implement 22.4 Mbaud symbol rate	8.2.7	c2	
3	Implement 16 Mbaud symbol rate	8.2.7	i	
4	Implement 1 ms frame duration	8.2.7	m	
5	Implement 5000 physical slots per frame	8.2.7	c1	
6	Implement 5600 physical slots per frame	8.2.7	c2	
7	Implement 4000 physical slots per frame	8.2.7	i	

c1: If profP1 then m else x// 25 MHz channel
c2: If profP2 then m else x// 28 MHz channel

A.7.4.5 Radio Subsystem Control

This subclause covers the requirements of section 8.2.8 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A243—Radio Subsystem Control - BS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	BS measures uplink burst timing and commands SS TX adjustments as needed.	8.2.8	m			
2	BS periodically measures uplink frequency offset, reports to SS via MAC message.	8.2.8	N/a			
3	The BS measures receiver power sufficiently often to handle the fading requirements of 10 dB/s.	8.2.8	m			

A.7.4.6 Minimum Performance

This subclause covers the requirements of section 8.2.9 of IEEE Std 802.16-2001 (12/6/2001): “Local and Metropolitan Area Networks – Part 16: Standard Air Interface for Fixed Wireless Access Systems”.

Table A244—Minimum Tx Performance - BS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Peak-to-peak symbol jitter, referenced to the previous symbol zero crossing of the transmitted waveform, as percentage of the nominal symbol duration when measured over a 2 second period	8.2.9	m		2 %	
2	Tx RF frequency	8.2.9	m		10-66 GHz	

Table A244—Minimum Tx Performance - BS

3	Tx RF frequency accuracy	8.2.9	m		+/- 10 ppm	
4	Spectral mask (OOB)	8.2.9	m		local regulation	
5	Spurious	8.2.9	m		local regulation	
6	Ramp up/ramp down time	8.2.9	m		<= 24 symbols	
7	Modulation accuracy when measured with an ideal receiver without an equalizer for QPSK	8.2.9	m		12%	
8	Modulation accuracy when measured with an ideal receiver without an equalizer for 16-QAM	8.2.9	m		6%	
9	Modulation accuracy when measured with an ideal receiver without an equalizer for 64-QAM	8.2.9	m		2%	
10	Modulation accuracy when measured with an ideal receiver with an equalizer for QPSK	8.2.9	m		10%	
11	Modulation accuracy when measured with an ideal receiver with an equalizer for 16-QAM	8.2.9	m		3%	
12	Modulation accuracy when measured with an ideal receiver with an equalizer for 64-QAM	8.2.9	m		1.5%	

Table A245—Minimum Rx Performance - BS

Item	Capability	Reference	Status	Support	Values Allowed	Values Supported
1	Dynamic Range	8.2.9	m		27 dB for QPSK	
2	BER performance threshold for QPSK, BER=10^{-3}	8.2.9	m		-94 + 10log(c1) dBm	
3	BER performance threshold for 16-QAM, BER=10^{-3}	8.2.9	m		-87 + 10log(c1) dBm	
4	BER performance threshold for 64-QAM, BER=10^{-3}	8.2.9	m		-79 + 10log(c1) dBm	
5	BER performance threshold for QPSK, BER=10^{-6}	8.2.9	m		-90 + 10log(c1) dBm	
6	BER performance threshold for 16-QAM, BER=10^{-6}	8.2.9	m		-83 + 10log(c1) dBm	
7	BER performance threshold for 64-QAM, BER=10^{-6}	8.2.9	m		-74 + 10log(c1) dBm	
8	1^{st} adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for QPSK	8.2.9	m		-9 dB	
9	1^{st} adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for 16-QAM	8.2.9	m		-2 dB	
10	1^{st} adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for 64-QAM	8.2.9	m		+5 dB	
11	1^{st} adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for QPSK	8.2.9	m		-5 dB	
12	1^{st} adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for 16-QAM	8.2.9	m		+2 dB	
13	1^{st} adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for 64-QAM	8.2.9	m		+9 dB	
14	1^{st} adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for QPSK	8.2.9	m		-5 dB	
15	1^{st} adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for 16-QAM	8.2.9	m		+2 dB	

Table A245—Minimum Rx Performance - BS

16	1st adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for 64-QAM	8.2.9	m		+9 dB	
17	1st adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for QPSK	8.2.9	m		-1 dB	
18	1st adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for 16-QAM	8.2.9	m		+6 dB	
19	1st adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for 64-QAM	8.2.9	m		+13 dB	
20	2nd adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for QPSK	8.2.9	m		-34 dB	
21	2nd adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for 16-QAM	8.2.9	m		-27 dB	
22	2nd adjacent channel interference at BER=10^{-3} for 3 dB degradation C/I for 64-QAM	8.2.9	m		-20 dB	
23	2nd adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for QPSK	8.2.9	m		-30 dB	
24	2nd adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for 16-QAM	8.2.9	m		-22 dB	
25	2nd adjacent channel interference at BER=10^{-3} for 1 dB degradation C/I for 64-QAM	8.2.9	m		-16 dB	
26	2nd adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for QPSK	8.2.9	m		-30 dB	
27	2nd adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for 16-QAM	8.2.9	m		-23 dB	
28	2nd adjacent channel interference at BER=10^{-6} for 3 dB degradation C/I for 64-QAM	8.2.9	m		-16 dB	
29	2nd adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for QPSK	8.2.9	m		-26 dB	
30	2nd adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for 16-QAM	8.2.9	m		-20 dB	
31	2nd adjacent channel interference at BER=10^{-6} for 1 dB degradation C/I for 64-QAM	8.2.9	m		-12 dB	

c1: if (profP1) then 25 else if (profP2) then 28

A.7.5 BS Test Modes

Table A246—BS Stand Alone Test Modes

Item	Capability	Reference	Status	Support
1	Turn off modulation and transmit a sine wave corresponding to the center frequency of the selected channel, using the same components as during normal transmission.		m	

Table A247—BS Stand End-to-End Test Modes

Item	Capability	Reference	Status	Support
1	Using a valid frame structure, after SS is at point in network entry where PHY modes can be changed, the BS can be instructed to interact with the BS at a fixed PHY mode (transmit and receive are independent), regardless of signal quality. The BS will inhibit any request by the SS to re-register, re-range, etc.		m	