

802.16™ Conformance

IEEE Standard for Conformance to IEEE 802.16

**Part 1: Protocol Implementation
Conformance Statement (PICS)
Proforma for 10–66 GHz
WirelessMAN-SC Air Interface**

**IEEE Computer Society
and the
IEEE Microwave Theory and Techniques Society**

Sponsored by the
LAN/MAN Standards Committee



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IEEE-SA Standards Board

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Abstract: This standard represents the Protocol Implementation Conformance Statement Proforma, per ISO/IEC 9646-7 (1995) and ITU-T X.296, for conformance specification of base stations and subscriber stations based upon the WirelessMAN-SC air interface specified in IEEE 802.16.

Keywords: broadband wireless access (BWA), compliance test, fixed broadband wireless access networks, local multipoint distribution service (LMDS), metropolitan area network, microwaves, millimeter waves, point-to-multipoint, wireless access systems (WAS), WirelessMAN standards

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Introduction

(This introduction is not part of IEEE Std 802.16/Conformance01-2003, IEEE Standard for Conformance to IEEE 802.16— Part 1: Protocol Implementation Conformance Statement (PICS) Proforma for 10–66 GHz WirelessMAN-SC Air Interface.)

This is the first of a set of standards specifying test methods for demonstrating conformance to IEEE Standard 802.16. It represents the Protocol Implementation Conformance Statement (PICS) Proforma for conformance specification of base stations and subscriber stations based upon the WirelessMAN-SC (10–66 GHz) air interface specified in IEEE Standard 802.16. The work was developed within the IEEE 802.16 Working Group beginning from August 2002 to April 2003.

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Interpretations and errata

Interpretations and errata associated with this amendment may be found at one of the following Internet locations:

- <http://standards.ieee.org/reading/ieee/interp/>
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IEEE Standard for Conformance to IEEE 802.16TM

Part 1: Protocol Implementation Conformance Statement (PICS) Proforma for 10–66 GHz WirelessMAN-SCTM Air Interface

1. Overview

This document is Part 1 of a multi-part deliverable addressing conformance to the WirelessMAN-SC air interface in IEEE 802.16TM:^{1,2}

- Part 1: Protocol Implementation Conformance Statement (PICS) proforma
- Part 2: Test Suite Structure and Test Purposes (TSS&TP) specification
- Part 3: Radio Conformance Test (RCT) specification
- Part 4: Abstract Test Suite (ATS) specification

1.1 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 (ICS).

1.2 Scope

This standard represents the Protocol Implementation Conformance Statement (PICS) Proforma, per ISO/IEC Standard 9646-7 (1995) and ITU-T X.296, for conformance specification of base stations and subscriber stations based upon the WirelessMAN-SC (10–66 GHz) air interface specified in IEEE 802.16.

1.3 Purpose

This document describes the capabilities and options within the WirelessMAN-SC (10–66 GHz) air interface specified in IEEE 802.16. It is to be completed by the supplier of a product claiming to implement the protocol. It indicates which capabilities and options have been implemented and what limitations might prevent interworking. It allows a customer of the product to evaluate its conformance and to determine whether the product meets the customer's requirements.

¹Information on references can be found in Clause 2.

²When IEEE 802.16 is referenced this generally includes the base document and any existing amendments and corrigenda.

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, IEEE Standard for Local and metropolitan area networks—Part 16: Air Interface for Fixed Broadband Wireless Access Systems.^{3, 4}

IEEE Std 802.16aTM-2003, IEEE Standard for Local and metropolitan area networks—Part 16: Air Interface for Fixed Broadband Wireless Access Systems—Amendment 2: Medium Access Control Modifications and Additional Physical Layer Specifications for 2–11 GHz.

IEEE Std 802.16cTM-2002, IEEE Standard for Local and metropolitan area networks—Part 16: Air Interface for Fixed Broadband Wireless Access Systems—Amendment 1: Detailed System Profiles for 10–66 GHz.

ISO/IEC 9646-1:1994, Information technology— Open Systems Interconnection—Conformance testing methodology and framework—Part 1: General concepts.⁵

ISO/IEC 9646-7:1995, Information technology— Open Systems Interconnection—Conformance testing methodology and framework—Part 7: Implementation Conformance Statements

3. Definitions and Abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply in conjunction with the terms defined in IEEE 802.16.

In particular, the following terms defined in ISO/IEC 9646-1:1994 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.

³IEEE publications are available from the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA (<http://standards.ieee.org>).

⁴The IEEE standards or products referred to in Clause 2 are trademarks belonging to the Institute of Electrical and Electronics Engineers, Inc.

⁵ISO/IEC publications are available from the ISO Central Secretariat, Case Postale 56, 1 rue de Varembé, CH-1211, Genève 20, Switzerland/Suisse (<http://www.iso.ch/>). ISO/IEC publications are also available in the United States from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado 80112, USA (<http://global.ihs.com/>). Electronic copies are available in the United States from the American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, USA (<http://www.ansi.org/>).

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply in conjunction with the abbreviations defined in IEEE 802.16.

ATS	Abstract Test Suite
ICS	Implementation Conformance Statement
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
RCT	Radio Conformance Test
SUT	System Under Test
TP	Test Purpose
TSS	Test Suite Structure

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 A.1.

Annex A

(normative)

Protocol ICS for IEEE 802.16 WirelessMAN-SC

A.1 Guidance for completing PICS Proforma⁶

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 for WirelessMAN-SC defined in IEEE 802.16 may provide information about the implementation in a standardized manner.

The PICS proforma is subdivided 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 clause(s) of IEEE 802.16 from which the requirement for the capability is derived.

⁶Copyright release for PICS proformas: Users of this standard may freely reproduce the PICS proforma in this annex so that it can be used for its intended purpose and may further publish the completed PICS.

Status column

The following notations, defined in ISO/IEC 9646-7:1995, 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 9646-7:1995, 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 Table A.1, 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 9646-7:1995, support for a received protocol data unit (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 column

The values column is only used when necessary in a table. It contains the type, the list, the range, or the length of values. 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 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:	A5/4 is the reference to the answer of item 4 in Table A5.
Example:	A6/3b is the reference to the second answer (i.e., in the second support column) of item 3 in Table A6.

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 A.1.2.

However, tables contained in A.5 shall only be completed for SS implementations, and tables contained in A.6 shall only be filled in for BS implementations.

If necessary, the supplier may provide additional comments in the 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

Year:	
Month:	
Day:	

A.2.2 Implementation Under Test (IUT) Identification

IUT name:	
IUT version:	

A.2.3 System Under Test (SUT) Identification

SUT name(line 1):	
SUT name(line 2):	
Hardware configuration(line 1):	
Hardware configuration(line 2):	
Hardware configuration(line 3):	
Operating system:	

A.2.4 Product Supplier

Name:	
Address (line1):	
Address (line2):	
Address (line3):	
Telephone number:	
Facsimile number:	
E-mail address:	
Additional information (1):	
Additional information (2):	
Additional information (3):	

A.2.5 Client (if different from product supplier)

Name:	
Address (line1):	
Address (line2):	
Address (line3):	
Telephone number:	
Facsimile number:	
E-mail address:	
Additional information (1):	
Additional information (2):	
Additional information (3):	

A.2.6 PICS Contact Person

Name of the person to contact if there are any queries concerning the content of the PICS.

Name:	
Address (line1):	
Address (line2):	
Address (line3):	
Telephone number:	
Facsimile number:	
E-mail address:	
Additional information (1):	
Additional information (2):	
Additional information (3):	

A.2.7 Identification of the Standard

This PICS proforma applies to IEEE 802.16 WirelessMAN-SC.

A.2.8 Profiles

Clause 12 of IEEE 802.16 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

A.1 defines the profile reference identifiers for use in this PICS proforma.

Table A.1—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.3 Global Statement of Conformance

Are all mandatory capabilities implemented? (Yes_/No_)

NOTE—Answering “No” to this question indicates non-conformance to IEEE 802.16 WirelessMAN-SC. 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.4 Roles

A.2 defines the roles of an IUT.

Table A.2—Roles

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

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

A.5 Subscriber Station

Prerequisite: A.2/1

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

A.5.1 Major SS Capabilities and Functionalities of the MAC

A.5.1.1 Convergence Sublayers

This subclause covers the requirements in Clause 5 of IEEE 802.16.

A.5.1.1.1 ATM Convergence Sublayer

This subclause covers the requirements of 5.1 of IEEE 802.16.

Table A.3—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	o	
6	CCS connection setup	5.1.2.4	c1	

c1: If A.3/5 THEN m ELSE x

A.5.1.1.2 Packet Convergence Sublayer

This subclause covers the requirements of 5.2 of IEEE 802.16.

Table A.4—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 TM Ethernet	5.2	o	
4	802.1Q TM 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 A.4/3 THEN o ELSE i

c2: If A.4/4 THEN o ELSE i

Table A.5—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	c1	
5	802.3 Ethernet classification	5.2.5.2	c2	
6	802.1Q VLAN classification	5.2.6.2	c3	
7	Payload header suppression support	5.2.4	o	

c1: IF A.4/2 OR A.4/6 OR A.4/8 THEN o ELSE i //IPv6 support

c2: IF A.4/3 OR A.4/5 OR A.4/6 THEN o ELSE i //Ethernet support

c3: IF A.4/4 OR A.4/7 OR A.4/8 THEN o ELSE i //802.1Q support

Table A.6—SS IP Classification in the Uplink

Prerequisite: A.5/3 OR A.5/4 SS supports IP classification

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

o.1: At least one of these items must be supported

Table A.7—SS Ethernet Classification in the Uplink

Prerequisite: A.5/5 SS supports Ethernet IEEE 802.3 classification

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

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

Table A.8—SS 802.1Q Classification in the Uplink

Prerequisite: A.5/6 SS supports 802.1Q Classification

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

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

A.5.1.2 Addressing and Connections

This subclause covers the requirements of 6.2.1 of IEEE 802.16.

Table A.9—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.5.1.3 Construction and Transmission of MAC PDUs

This subclause covers the requirements of 6.2.3 of IEEE 802.16.

A.5.1.3.1 Conventions

Table A.10—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.5.1.3.2 PDU Concatenation

Table A.11—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.5.1.3.3 SDU Fragmentation**Table A.12—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 FSN 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	
7	Refrain from fragmenting on connections with fragmentation turned off	6.2.3.3, 6.2.3.4.1, 11.4.8.12	m	

A.5.1.3.4 Packing**Table A.13—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 A.13/3 THEN o ELSE n/a

A.5.1.3.5 CRC**Table A.14—CRC**

Item	Capability	Reference	Status	Support
1	Compute and add CRC	6.2.3.5	o	
2	Check CRC of MAC PDUs received on connection with CRC enabled and discard any MAC PDU that fails check	6.2.3.5	c1	

c1: if A14/1 then m else i

A.5.1.4 Uplink Scheduling Service

This subclause covers the requirements of 6.2.5 of IEEE 802.16.

Table A.15— Uplink Scheduling Service

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

o.1: Must support at least one of these options

c1: IF A.15/1 THEN m ELSE n/a

A.5.1.5 Bandwidth Allocation and Request Mechanism

This subclause covers the requirements of 6.2.6 of IEEE 802.16.

Table A.16—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	c4	
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	Respond to Unicast Polls	6.2.6.4.1	m	
8	Respond to Broadcasts Polls	6.2.6.4.2	c3	
9	Respond to Multicast Polls	6.2.6.4.2	c1	
10	Use Poll-me Bit	6.2.6.4.3	c2	
11	Correctly set SI bit	6.2.5.1	c2	

c1: IF A.32/2 THEN m ELSE n/a

c2: IF A.15/1 THEN m ELSE n/a

c3: IF A.15/3 OR A.15/4 THEN m ELSE o

c4: IF A.16/2 THEN m ELSE o

A.5.1.6 MAC Support of PHY layers

This subclause covers the requirements of 6.2.7 of IEEE 802.16.

Table A.17—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	c3	
4	TDD	6.2.7.3	c4	

c1: IF (profP1f OR profP2f) THEN m ELSE n/a

c2: IF A.122/1 THEN m ELSE n/a

c3: IF A.122/2 THEN m ELSE n/a

c4: IF (profP1t OR prof P2t) THEN m ELSE n/a

Table A.18—Map Relevance – SS

Item	Capability	Reference	Status	Support
1	Processing delay for UL-MAP < 200us	6.2.7.6.1	m	
2	Capable of handling UL-MAP with offset up to 4096 minislots providing Allocation Start Time + Offset of Null IE ≤ 2ms	6.2.7.6.1	m	

A.5.1.7 Contention Resolution

This subclause covers the requirements of 6.2.8 of IEEE 802.16.

Table A.19—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 A.16/8 OR A.16/9 THEN m ELSE n/a

A.5.1.8 Network Entry and Initialization

This subclause covers the requirements of 6.2.9 of IEEE 802.16.

Table A.20—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.5.1.8.1 Obtain Downlink Parameters

This subclause covers the requirements of 6.2.9.2 of IEEE 802.16.

Table A.21—Obtain Downlink Parameters

Item	Capability	Reference	Status	Support
1	SS scans allowed channels for preamble and DL-MAP	6.2.9.2	m	
2	SS receives DL-MAP correctly	6.2.9.2	m	
3	SS receives DCD correctly	6.2.9.2	m	
4	SS maintains downlink synch correctly	6.2.9.2	m	

A.5.1.8.2 Obtain Uplink Parameters

This subclause covers the requirements of 6.2.9.3 and 6.2.9.4 of IEEE 802.16.

Table A.22—Obtain Uplink Parameters

Item	Capability	Reference	Status	Support
1	SS receives UCD correctly	6.2.9.3, 6.2.9.4	m	
2	SS maintains uplink parameters	6.2.9.3	m	

A.5.1.8.3 Initial Ranging

This subclause covers the requirements of 6.2.9.5 and 6.2.9.6 of IEEE 802.16.

Table A.23—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	
9	Use the RNG-REQ message in station maintenance interval.	6.2.10	m	

A.5.1.8.4 Negotiate Basic Capabilities

This subclause covers the requirements of 6.2.9.7 of IEEE 802.16.

Table A.24—Negotiate Basic Capabilities

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	
3	SS resends SBC-REQ on time-out	6.2.9.7	m	

A.5.1.8.5 SS Authorization

This subclause covers the requirements of 6.2.9.8 of IEEE 802.16.

Table A.25—SS Authorization

Item	Capability	Reference	Status	Support
1	SS sends Authorization Request (PKM-REQ with <i>Code=4</i>)	6.2.9.8, 7.2	m	
2	SS receives Authorization Reply (PKM-REQ with <i>Code=5</i>)	6.2.9.8, 7.2	m	
3	SS stores Authorization Key (AK) and derives KEK, HMAC_KEY_U and HMAC_KEY_D	6.2.9.8, 7.2	m	
4	SS establishes SAs listed in Authorization Reply	6.2.9.8, 7.2	m	
5	SS resends Authorization Request on time-out	6.2.9.8, 7.2	m	

A.5.1.8.6 Registration

This subclause covers the requirements of 6.2.9.9 of IEEE 802.16.

Table A.26—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 time-out	6.2.9.9	m	

A.5.1.8.7 Establish IP Connectivity

This subclause covers the requirements of 6.2.9.10 of IEEE 802.16.

Table A.27—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.5.1.8.8 Establish ToD

This subclause covers the requirements of 6.2.9.11 of IEEE 802.16.

Table A.28—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.5.1.8.9 TFTP-CPLT, TFTP-RSP

This subclause covers the requirements of 6.2.9.12 of IEEE 802.16.

Table A.29—TFTP-CPLT, TFTP-RSP

Item	Role	Reference	Status	Support
1	SS sends TFTP-CPLT after successful configuration	6.2.9.12	m	
2	SS receives TFTP-RSP after sending TFTP-CPLT	6.2.9.12	m	
3	SS retransmits TFTP-CPLT on failure to receive TFTP-RSP after sending TFTP-CPLT	6.2.9.12	m	

A.5.1.9 Periodic Ranging and Downlink Burst Profile Management

This subclause covers the requirements of 6.2.10 of IEEE 802.16.

Table A.30—Periodic Ranging – SS

Item	Capability	Reference	Status	Support
1	Reinitialize after T4 with no periodic ranging opportunity	6.2.10	m	
2	Re-range after RNG-RSP with Ranging Status = re-range (4)	6.2.10	m	
3	Adjust timing and/or transmit power in response to a received RNG-RSP	6.2.10	m	
4	Request change to more appropriate DL burst profile with the DBPC-REQ message based upon thresholds in DCD	6.2.10	m	
5	Change DL burst profile based upon RNG-RSP.	6.2.10	m	
6	Change DL burst profile based upon DBPC-RSP	6.2.10	m	

A.5.1.10 Update of Channel descriptors

This subclause covers the requirements of 6.2.11 of IEEE 802.16.

Table A.31—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.5.1.11 Multicast Polling Groups

This subclause covers the requirements of 6.2.12 of IEEE 802.16.

Table A.32—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.5.1.12 Quality of Service

This subclause covers the requirements of 6.2.13 of IEEE 802.16.

A.5.1.12.1 Dynamic Service Flow Operations**Table A.33—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 AND A.3/5) THEN m ELSE x // only for SVCs and soft- PVCs

A.5.1.12.2 SS Initiated Dynamic Service Flow Creation**Table A.34—SS Initiated Service Flow Creation**

Prerequisite: A.33/2

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

A.5.1.12.3 BS Initiated Service Flow Creation**Table A.35—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.5.1.12.4 SS Initiated Dynamic Service Flow Change**Table A.36—SS Initiated Service Flow change**

Prerequisite: A.33/4

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

A.5.1.12.5 BS Initiated Service Flow Change**Table A.37—BS Initiated Service Flow 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.5.1.12.6 SS Initiated Service Flow Deletion**Table A.38—SS Initiated Service Flow Deletion**

Prerequisite: A.33/6

Item	Role	Reference	Status	Support
1	SS sends dynamic service deletion (DSD)-REQ	6.2.13	m	
2	SS receives DSD-RSP	6.2.13	m	

A.5.1.12.7 BS Initiated Service Flow Deletion**Table A.39—BS Initiated Service Flow Deletion**

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

A.5.1.13 SS PKM Functions

This subclause covers the requirements of Clause 7 of IEEE 802.16.

Table A.40—PKM Functions

Item	Capability	Reference	Status	Support
1	SS supports Authorization	7.2.4	m	
2	SS supports AK exchange	7.2.4	m	
3	SS supports TEK exchange	7.2.5, 7.5.2	m	
4	SS support user data encryption	7.5.1	m	
5	SS supports PKM message authentication	7.5.3	m	
6	SS supports MAC management message authentication	7.5.3	m	
7	SS supports Primary SA	7.1.3	m	
8	SS supports Static SAs	7.1.3	o	
9	SS supports Dynamic SAs	7.1.4	o	
10	SS supports dynamic SA mapping	7	c1	
11	SS supports rules for TEK usage	7.4.2.3	m	
12	SS supports rules for AK usage	7.4.2.2	m	

c1: IF A.40/9 THEN m ELSE n/a

Table A.41—SS Encryption and Authentication Algorithms

Item	Capability	Reference	Status	Support
1	DES data encryption/decryption	7.5.1	m	
2	3DES KEK decryption	7.5.2	m	
3	RSA decryption with 1024 bit key	7.5.5	m	
4	HMAC with Secure Hash Algorithm (SHA)-1	7.5.3	m	
5	SA with no encryption/decryption as encryption algorithm	7	m	

A.5.1.14 Configuration File

This subclause covers the requirements of 6.2.9.12 and Clause 9 of IEEE 802.16.

Table A.42—DHCP and Configuration File

Item	Capability	Reference	Status	Support
1	Tx TFTP-CPLT	6.2.9.12	m	
2	Rx TFTP-RSP	6.2.9.12	m	
3	Transfer Configuration File	6.2.9.12	m	
4	Support Configuration File format	9	m	
5	Software Upgrade Filename	9	m	
6	Software Upgrade TFTP Server IP Address	9	m	
7	Vendor specific Configuration Settings	9	o	

A.5.1.15 Reset and De/Re-Register Commands**Table A.43—Reset and De/Re-Register Commands**

Item	Capability	Reference	Status	Support
1	Perform action commanded in RES-CMD	6.2.2.3.22	m	
2	Perform action commanded in DREG-CMD	6.2.2.3.26	m	

A.5.2 MAC PDU Descriptions, Seen From the SS

This subclause covers the requirements of the various PDU formats.

A.5.2.1 Headers and Subheaders

Table A.44—Headers and Subheaders – SS

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	m	
4	Support of Bandwidth Request Header – Rx	6.2.2.1.2	n/a	
5	Support Fragmentation Subheader – Tx	6.2.2.2.1	m	
6	Support Fragmentation Subheader – 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 A.15/1 THEN m ELSE n/a

c2: IF A.16/2 THEN m ELSE n/a

c3: IF A.13/3 THEN m ELSE n/a

A.5.2.2 MAC Management PDUs

This clause 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.5.2.2.1 UCD Message**Table A.45—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	m	
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	

Table A.46—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	m	
8	BTC Column Type –Rx	11.1.1.2	m	
9	BTC Interleaving Type –Rx	11.1.1.2	m	
10	Scrambler Seed –Rx	11.1.1.2	m	
11	Last Codeword Length –Rx	11.1.1.2	m	

A.5.2.2.2 DCD message**Table A.47—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 A.48—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	n/a	
6	BTC Row Code Type – Rx	11.1.2.2	m	
7	BTC Column Type – Rx	11.1.2.2	m	
8	BTC Interleaving Type – Rx	11.1.2.2	m	
9	Last Codeword Length – Rx	11.1.2.2	m	
10	DIUC Mandatory exit Threshold – Rx	11.1.2.2	m	
11	DIUC minimum entry Threshold – Rx	11.1.2.2	m	
12	Preamble present – Rx	11.1.2.2	m	

A.5.2.2.3 DL-MAP**Table A.49—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.5.2.2.4 UL-MAP**Table A.50—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.5.2.2.5 RNG-REQ**Table A.51—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	c1	
4	SS MAC Address – Tx	11.1.3	m	
5	Ranging Anomalies	11.1.3	m	

c1: IF A.23/7 THEN m ELSE n/a

A.5.2.2.6 RNG-RSP**Table A.52—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.5.2.2.7 REG-REQ**Table A.53—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.5.2.2.8 REG-RSP**Table A.54—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	11.4.0	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 A.53/4 THEN m ELSE n/a

A.5.2.2.9 PKM-REG/RSP**A.5.2.2.9.1 Security Association Add Parameters****Table A.55—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.5.2.2.9.2 Authorization Request Parameters**Table A.56—Authorization Request Parameters**

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

A.5.2.2.9.3 Authorization Reply Parameters**Table A.57—Authorization Reply Parameters**

Item	Capability	Reference	Status	Support
1	Authorization-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.5.2.2.9.4 Authorization Reject Parameters**Table A.58—Authorization Reject Parameters**

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

A.5.2.2.9.5 Key Request Parameters**Table A.59—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.5.2.2.9.6 Key Reply Parameters**Table A.60—Authorization 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.5.2.2.9.7 Key Reject Parameters**Table A.61—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.5.2.2.9.8 Authorization Invalid Parameters**Table A.62—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.5.2.2.9.9 TEK Invalid Parameters**Table A.63—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.5.2.2.9.10 Authentication Information Parameters**Table A.64—Authentication Information Parameters**

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

A.5.2.2.10 DSA-REQ**Table A.65—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	c5	
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 AND A.3/5 THEN m ELSE x // only for SVCs and soft-PVCs
c2: IF A.15/4 THEN m ELSE n/a // only for best effort service
c3: IF A.53/4 THEN m ELSE n/a
c4: IF profM1 THEN m ELSE n/a
c5: IF Table A.15/2 OR TableA.15/3 THEN m ELSE n/a

Table A.66—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 ID– 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	Payload Header Suppression Rule – Rx	11.4.9.3	c4	
18	Payload Header Suppression Index – Rx	11.4.9.3	c4	
19	Payload Header Suppression Field – Rx	11.4.9.3	c4	
20	Payload Header Suppression Mask – Rx	11.4.9.3	c4	
21	Payload Header Suppression Size – Rx	11.4.9.3	c4	
22	Payload Header Suppression Verification – Rx	11.4.9.3	c4	
23	Vendor Specific PHS Parameters – Rx	11.4.9.3	c6	

c1: m for IPV4 services, IF A.5/4 THEN m for IPV6 services // IP
c2: IF A.5/5 THEN m ELSE n/a // Ethernet
c3: IF A.5/6 THEN m ELSE n/a // VLAN
c4: IF A.5/7 THEN m ELSE n/a // PHS
c5: IF A.53/4 THEN o ELSE n/a // Vendor ID
c6: IF A.5/7 and A.53/4 THEN o ELSE n/a // PHS & Vendor ID

Table A.67—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	
4	ATM Classifier Rule	11.4.9.4	m	

A.5.2.2.11 DSA-RSP**Table A.68—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	
16	Service Flow Scheduling Type – Tx	11.4.8.11	x	

Table A.68—DSA-RSP Message (continued)

Item	Capability	Reference	Status	Support
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 AND A.3/5) THEN m ELSE x // only for SVCs and soft-PVCs

Table A.69—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 A.5/7 THEN m ELSE n/a // PHS

c2: IF A.5/7 THEN o ELSE n/a // PHS

Table A.70—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.5.2.2.12 DSA-ACK**Table A.71—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	
10	HMAC Tuple – Rx	11.4.10	m	

c1: IF (profM1 AND A.3/5) THEN m ELSE x // only for SVCs and soft-PVCs

A.5.2.2.13 DSC-REQ

Table A.72—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	c5	
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	n/a	
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	n/a	
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 AND A.3/5) THEN m ELSE x // only for SVCs and soft-PVCs

c2: IF A.15/4 THEN m ELSE n/a // only for best effort service

c3: IF (A.53/4) THEN m ELSE n/a

c4: IF Table A.15/2 OR TableA.15/3 THEN m ELSE n/a

Table A.73—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 A.5/4 THEN m for IPV6 services // IP
 c2: IF A.5/5 THEN m ELSE n/a // Ethernet
 c3: IF A.5/6 THEN m ELSE n/a // VLAN
 c4: IF A.5/7 THEN m ELSE n/a // PHS
 c5: IF A.5/4 THEN o ELSE n/a // Vendor ID
 c6: IF A.5/7 and A.5/4 THEN o ELSE n/a // PHS & Vendor ID

Table A.74—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	
4	ATM Classifier Change Action	11.4.9.4	m	
5	ATM Classifier Rule	11.4.9.4	m	

A.5.2.2.14 DSC-RSP**Table A.75—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	
16	Service Flow Scheduling Type – Tx	11.4.8.11	x	

Table A.75—DSC-RSP Message (continued)

Item	Capability	Reference	Status	Support
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 AND A.3/5) THEN m ELSE x // only for SVCs and soft-PVCs

Table A.76—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 A.5/7 THEN m ELSE n/a

// PHS

c2: IF A.5/7 THEN o ELSE n/a

// PHS

Table A.77—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	
4	ATM Classifier Change Action	11.4.9.4	x	
5	ATM Classifier Rule	11.4.9.4	x	

A.5.2.2.15 DSC-ACK**Table A.78—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 AND A.3/5) THEN m ELSE x

// only for SVCs and soft-PVCs

A.5.2.2.16 DSD-REQ**Table A.79—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 AND A.3/5) THEN m ELSE x

// only for SVCs and soft-PVCs

A.5.2.2.17 DSD-RSP**Table A.80—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 AND A.3/5) THEN m ELSE x // only for SVCs and soft-PVCs

A.5.2.2.18 MCA-REQ**Table A.81—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.5.2.2.19 MCA-RSP**Table A.82—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.5.2.2.20 DBPC-REQ**Table A.83—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.5.2.2.21 DBPC-RSP**Table A.84—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.5.2.2.22 RES-CMD**Table A.85—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.5.2.2.23 SBC-REQ**Table A.86—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.5.2.2.24 SBC-RSP**Table A.87—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	n/a	

A.5.2.2.25 CLK-CMP**Table A.88—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.5.2.2.26 DREG-CMD**Table A.89—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.5.2.2.27 DSX-RVD**Table A.90—DSX-RVD Message**

Item	Capability	Reference	Status	Support
1	DSX-RVD – Rx	6.2.2.3.27	c1	
2	DSX-RVD – Tx	6.2.2.3.27	x	

c1: IF profM1 and A.3/5 THEN m ELSE n/a

A.5.2.2.28 TFTP-CPLT**Table A.91—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.5.2.2.29 TFTP-RSP**Table A.92—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.5.2.3 ATM CS PDUs**Table A.93—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.5.2.4 Packet CS PDUs

Table A.94—Packet CS PDUs

Prerequisite: profM2

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

A.5.3 PDU Parameters

This subclause covers the requirements of 10 of IEEE 802.16.

A.5.3.1 Parameters and Constants

This subclause covers the requirements of Clause 10 of IEEE 802.16.

A.5.3.1.1 Global Values

Table A.95—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	
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 minislots ELSE IF (profM2) THEN 1295 minislots ELSE 4096 minislots

Table A.96—SS Global Parameters Local Support

Item	Capability	Reference	Status	Support	Values	Values Supported
1	DL-MAP Interval	10.1	m		1ms	
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	Registration Request Retries	10.1	m		≥ 3	
8	Data Retries	10.1	n/a		n/a	
9	Mini-slot size	10.1	m		2	
10	DSx Request Retries	10.1	c1		3	
11	DSx Response Retries	10.1	m		3	
12	TFTP Download Retries	10.1	m		3	
13	TFTP Wait	10.1	m		10 min	
14	ToD Retries	10.1	m		3	
15	ToD retry period	10.1	m		≥ 5 min	
16	T1	10.1	m		50 s	
17	T2	10.1	m		10 s	
18	T3	10.1	m		200 ms	
19	T4	10.1	m		30s..35s	
20	T5	10.1	i		2s	
21	T6	10.1	m		3s	
22	T7	10.1	m		1s	
23	T8	10.1	m		300 ms	
24	T10	10.1	m		3s	
25	T12	10.1	m		50s	
26	T14	10.1	m		200 ms	

c1: IF profM1 AND A.3/5 THEN m ELSE n/a

A.5.3.1.2 PKM Parameter Values**Table A.97—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 A.98—SS PKM Parameters Local Support

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Authorization Wait Time-out	10.2	m		2s..30s	
2	Reauthorization Wait Time-out	10.2	m		2s..30s	
3	Authorization Grace Time	10.2	m		5 min..35 days	
4	Operational Wait Time-out	10.2	m		1s..10s	
5	Rekey Wait Time-out	10.2	m		1s..10s	
6	TEK Grace Time	10.2	m		5 min..3.5 days	
7	Authorize reject Wait Time-out	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.5.3.1.3 10–66 GHz PHY Specific Values**Table A.99—SS PHY-Specific Parameters Support**

Item	Capability	Reference	Status	Support	Values	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.5.3.1.4 Well Known Addresses and Identifiers**Table A.100—SS Well Known CIDs**

Item	Capability	Reference	Status	Support
1	Initial Ranging = 0 x 0000	10.4	m	
2	0 x 0000 < Basic CID < Primary Management CID < (Transport and Secondary Management CIDs) < 0 x FF00	10.4	m	
3	Multicast Polling CIDs in range 0 x FF00.. 0 x FFFD	10.4	c1	
4	Broadcast CID = 0 x FFFF	10.4	m	

c1: IF A.32/2 THEN m ELSE n/a

A.5.3.2 MAC Management Message Encodings

A.5.3.2.1 UCD Message Encodings

Table A.101—SS UCD Channel Encodings Support

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Burst descriptor	11.1.1.1	m		See A.102	
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 A.102—SS UCD Burst Profile Encodings Support

Item	Capability	Reference	Status	Support	Values	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.5.3.2.2 DCD Message Encodings**Table A.103—SS DCD Channel Encodings Support**

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Burst descriptor	11.1.2.1	m		See A.104	
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 OR profP2t) THEN 0
 ELSE IF (profP2f OR profP2f) THEN 1

Table A.104—SS DCD Burst Profile Encodings Support

Item	Capability	Reference	Status	Support	Values	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	n/a		1	
6	BTC Row Code Type	11.1.2.2	n/a			
7	BTC Column Type	11.1.2.2	n/a			
8	BTC Interleaving Type	11.1.2.2	n/a			
9	Last Codeword Length	11.1.2.2	m		c1	
10	DIUC Mandatory exit Threshold	11.1.2.2	m			
11	DIUC minimum entry Threshold	11.1.2.2	m			
12	Preamble present	11.1.2.2	m		0..1	

c1: IF (FEC Code Type = 1) THEN 1 ELSE 2

A.5.3.2.3 RNG-REQ Message Encodings**Table A.105—SS RNG-REQ Encodings Support**

Item	Capability	Reference	Status	Support	Values	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.5.3.2.4 RNG-RSP Message Encodings**Table A.106—SS RNG-RSP Encodings Support**

Item	Capability	Reference	Status	Support	Values	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 Override	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		0 x 0001..m	
10	Primary Management CID	11.1.4	m		m + 1..2m	

A.5.3.2.5 MCA-REQ Message Encodings**Table A.107—SS MCA-REQ Encodings Support**

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Multicast CID	11.1.5	m		0 x FF00..0 x FFFE	
2	Assignment	11.1.5	m		0..1	

A.5.3.3 PKM Message Encodings**Table A.108—PKM Message Encodings Support**

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

Table A.109—PKM Configuration Settings Support

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Authorize Wait Time-out	11.2.19	m		2–30s	
2	Reauthorize Wait Time-out	11.2.19	m		2–30s	
3	Authorization Grace Time	11.2.19	m		60s, 300–3024000s	
4	Operational Wait Time-out	11.2.19	m		1–10s	
5	Rekey Wait Time-out	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.5.3.4 Common Encodings

This subclause covers the requirements of 11.4 of IEEE 802.16.

Table A.110—Common Encodings

Item	Capability	Reference	Status	Support	Values	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	o			
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	o			
12	Confirmation Code	11.4.12	m			

A.5.3.4.1 SS Capabilities Encodings

This subclause covers the requirements of 11.4.1 of IEEE 802.16.

Table A.111—SS Capabilities Encodings

Item	Capability	Reference	Status	Support	Values	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 A.32/2 THEN m ELSE n/a

A.5.3.4.1.1 SS PHY Parameter Encodings

Table A.112—SS PHY Parameter Encodings

Item	Capability	Reference	Status	Support	Values	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.5.3.4.2 Convergence Sublayer Capabilities Encodings

This subclause covers the requirements of 11.4.5 of IEEE 802.16.

Table A.113—Convergence Sublayer Capabilities Encodings

Item	Capability	Reference	Status	Support	Values	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.5.3.4.3 Service Flow Encodings

This subclause covers the requirements of 11.4.8 of IEEE 802.16.

Table A.114—Service Flow Encodings

Item	Capability	Reference	Status	Support	Values	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		$0 \times 00 - 0 \times 07$	
6	Traffic Priority	11.4.8.6	m		0–7	
7	Maximum Sustained Traffic Rate	11.4.8.7	m		$0-(2^{32}-1)$	
8	Maximum Traffic Burst	11.4.8.8	m		$0-(2^{32}-1)$	

Table A.114—Service Flow Encodings (continued)

Item	Capability	Reference	Status	Support	Values	Values Supported
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.5.3.4.3.1 Service Flow Error Parameters

Table A.115—Service Flow Error Parameters

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Errored Parameter	11.4.8.4	m			
2	Error Code	11.4.8.4	m		1–14	
3	Error Message –Tx	11.4.8.4	o			
4	Error Message – Rx	11.4.8.4	m			

A.5.3.4.4 Convergence Sublayer Specific Service Flow Encodings

This subclause covers the requirements of 11.4.9 of IEEE 802.16.

Table A.116—Convergence Sublayer Specific Service Flow Encodings

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Convergence Sublayer Specification	11.4.9.1	m		c3, c4	
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

c3: IF profM1 THEN 0

c4: IF profM2 THEN 1–8

A.5.3.4.4.1 Packet CS Encodings

This subclause covers the requirements of 11.4.9.3 of IEEE 802.16.

Table A.117—Packet CS Encodings

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values	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.5.3.4.4.1.1 Classifier Error Parameter Set**Table A.118—Classifier Error Parameters Set Parameters**

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values	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 –Tx	11.4.9.3	o			
4	Error Message – Rx	11.4.9.3	m			

A.5.3.4.4.1.2 Packet Classification Rule Parameters**Table A.119—Packet Classification Rule Parameters**

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values	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			
10	Ethertype/IEEE 802.2 SAP	11.4.9.3	c2			
11	IEEE 802.1D User Priority	11.4.9.3	c3			

Table A.119—Packet Classification Rule Parameters (continued)

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values	Values Supported
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 –Tx	11.4.9.3	c5			
20	Error Message – Rx	11.4.9.3	c4			

c1: IF A.4/(1, 2, 5, 6, 7, OR 8) THEN m ELSE n/a \\ IP
 c2: IF A.4/(3, 4, 5, 6, 7, OR 8) THEN m ELSE n/a \\ Ethernet
 c3: IF A.4/(4, 7, OR 8) THEN m ELSE n/a \\ VLAN
 c4: IF A.5/7 THEN m ELSE n/a \\ PHS
 c5: IF A.5/7 THEN o ELSE n/a \\ PHS

A.5.3.4.4.1.3 Payload Header Suppression Rule Parameter Set**Table A.120—Classifier Error Parameters Set Parameters**

Prerequisite: (profM2 and A.5/7)

Item	Capability	Reference	Status	Support	Values	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.5.3.4.4.2 ATM CS Encodings

This subclause covers the requirements of 11.4.9.4 of IEEE 802.16.

Table A.121—ATM CS Encodings

Prerequisite: profM1

Item	Capability	Reference	Status	Support	Values	Values Supported
1	ATM Switching Encodings	11.4.9.4	m		0, 1, 2	
2	VPI Classifier	11.4.9.4	m		0 x 00XX	
3	VCI Classification	11.4.9.4	m			
4	ATM Classifier	11.4.9.4	m			
5	ATM Classifier ID	11.4.9.4	m			
6	ATM Classifier DSC Action	11.4.9.4	m			

A.5.4 Major SS Capabilities and Functionalities of the PHY

This subclause covers the requirements of Clause 8 of IEEE 802.16.

A.5.4.1 Multiplexing and Multiple Access Schemes

This subclause covers the requirements of 8.2 of IEEE 802.16.

Table A.122—Multiplexing and Multiple Access – SS

Item	Capability	Reference	Status	Support
1	Full-Duplex FDD	8.2.4.1	o.1	
2	Half-Duplex FDD	8.2.4.1	o.1	
3	TDD	8.2.4.2	c2	

Table A.122—Multiplexing and Multiple Access – SS

4	Tx/Rx Transition Gap	8.2.4.2.1	c3	
5	Rx/Tx Transition Gap	8.2.4.2.2	c3	
6	Downlink - TDM portion of burst	8.2.5	m	
7	Downlink - Demodulate TDMA portion of burst	8.2.5	c1	
8	Uplink Burst Subframe Structure – support contention slots for initial access	8.2.6	m	
9	Uplink Burst Subframe Structure – support contention slots for bandwidth request	8.2.6	m	
10	Uplink Burst Subframe Structure – support scheduled slots	8.2.6	m	
11	Uplink Burst Profile Modes	8.2.6	m	
12	DL frequency < UL Frequency unless otherwise required by regulators.		c4	
13	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: IF (profP1f or profP2f) THEN exactly one of these options must be supported ELSE i

c1: IF (profP1f OR profP2f) THEN m ELSE n/a

c2: IF (profP1t OR profP2t) THEN m ELSE n/a

c3: IF (A.122/2 OR A.122/3) THEN m ELSE n/a

c4: IF (A.122/1 OR A.122/2) THEN m ELSE n/a

A.5.4.2 Downlink Physical Layer

This subclause covers the requirements of 8.2.5 of IEEE 802.16.

Table A.123—Downlink Physical Layer – SS

Item	Capability	Reference	Status	Support	Values	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 symbols	
13	Burst preamble	8.2.5	c1		16 symbols	
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.5.4.3 Uplink Physical Layer

This subclause covers the requirements of 8.2.6 of IEEE 802.16.

Table A.124—Uplink Physical Layer – SS

Item	Capability	Reference	Status	Support	Values	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 symbols repeated 1..2	
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	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			
23	Stuffing	8.2.6.3.2	m			

A.5.4.4 Baud Rates and Channel Widths

This subclause covers the requirements of 8.2.7 of IEEE 802.16.

Table A.125—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.5.4.5 Radio Subsystem Control

This subclause covers the requirements of 8.2.8 of IEEE 802.16.

Table A.126—Radio Subsystem Control – SS

Item	Capability	Reference	Status	Support	Values	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.5.4.6 Minimum Performance

This subclause covers the requirements of 8.2.9 of IEEE 802.16.

Table A.127—Minimum Performance – SS

Item	Capability	Reference	Status	Support	Values	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	
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%	
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	

Table A.127—Minimum Performance – SS (continued)

Item	Capability	Reference	Status	Support	Values	Values Supported
22	BER performance threshold for 64-QAM, BER= 10^{-3}	8.2.9	m		$-79 + 10\log(c3)$ dBm	
23	BER performance threshold for QPSK, BER= 10^{-6}	8.2.9	m		$-90 + 10\log(c3)$ dBm	
24	BER performance threshold for 16-QAM, BER= 10^{-6}	8.2.9	m		$-83 + 10\log(c3)$ dBm	
25	BER performance threshold for 64-QAM, BER= 10^{-6}	8.2.9	m		$-74 + 10\log(c3)$ dBm	
26	Transition time from Tx to Rx and from Rx to Tx	8.2.9	c1		c2	
27	1 st adjacent channel interference at BER= 10^{-3} for 3 dB degradation C/I for QPSK	8.2.9	m		-9 dB	
28	1 st adjacent channel interference at BER= 10^{-3} for 3 dB degradation C/I for 16-QAM	8.2.9	m		-2 dB	
29	1 st adjacent channel interference at BER= 10^{-3} for 3 dB degradation C/I for 64-QAM	8.2.9	m		+5 dB	
30	1 st adjacent channel interference at BER= 10^{-3} for 1 dB degradation C/I for QPSK	8.2.9	m		-5 dB	
31	1 st adjacent channel interference at BER= 10^{-3} for 1 dB degradation C/I for 16-QAM	8.2.9	m		+2 dB	
32	1 st adjacent channel interference at BER= 10^{-3} for 1 dB degradation C/I for 64-QAM	8.2.9	m		+9 dB	
33	1 st adjacent channel interference at BER= 10^{-6} for 3 dB degradation C/I for QPSK	8.2.9	m		-5 dB	
34	1 st adjacent channel interference at BER= 10^{-6} for 3 dB degradation C/I for 16-QAM	8.2.9	m		+2 dB	
35	1 st adjacent channel interference at BER= 10^{-6} for 3 dB degradation C/I for 64-QAM	8.2.9	m		+9 dB	
36	1 st adjacent channel interference at BER= 10^{-6} for 1 dB degradation C/I for QPSK	8.2.9	m		-1 dB	
37	1 st adjacent channel interference at BER= 10^{-6} for 1 dB degradation C/I for 16-QAM	8.2.9	m		+6 dB	
38	1 st adjacent channel interference at BER= 10^{-6} for 1 dB degradation C/I for 64-QAM	8.2.9	m		+13 dB	
39	2 nd adjacent channel interference at BER= 10^{-3} for 3 dB degradation C/I for QPSK	8.2.9	m		-34 dB	
40	2 nd adjacent channel interference at BER= 10^{-3} for 3 dB degradation C/I for 16-QAM	8.2.9	m		-27 dB	
41	2 nd adjacent channel interference at BER= 10^{-3} for 3 dB degradation C/I for 64-QAM	8.2.9	m		-20 dB	
42	2 nd adjacent channel interference at BER= 10^{-3} for 1 dB degradation C/I for QPSK	8.2.9	m		-30 dB	
43	2 nd adjacent channel interference at BER= 10^{-3} for 1 dB degradation C/I for 16-QAM	8.2.9	m		-22 dB	
44	2 nd adjacent channel interference at BER= 10^{-3} for 1 dB degradation C/I for 64-QAM	8.2.9	m		-16 dB	

Table A.127—Minimum Performance – SS (continued)

Item	Capability	Reference	Status	Support	Values	Values Supported
45	2 nd adjacent channel interference at BER=10 ⁻⁶ for 3 dB degradation C/I for QPSK	8.2.9	m		-30 dB	
46	2 nd adjacent channel interference at BER=10 ⁻⁶ for 3 dB degradation C/I for 16-QAM	8.2.9	m		-23 dB	
47	2 nd adjacent channel interference at BER=10 ⁻⁶ for 3 dB degradation C/I for 64-QAM	8.2.9	m		-16 dB	
48	2 nd adjacent channel interference at BER=10 ⁻⁶ for 1 dB degradation C/I for QPSK	8.2.9	m		-26 dB	
49	2 nd adjacent channel interference at BER=10 ⁻⁶ for 1 dB degradation C/I for 16-QAM	8.2.9	m		-20 dB	
50	2 nd 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 (A.122/3 OR A.122/4) m ELSE x // define only for HD FDD and TDD
c2: IF A.122/3 THEN 20 us // HD FDD
ELSE IF A.122/4 THEN 2 us ELSE I // TDD
c3: IF (profP1) THEN 25 ELSE IF (profP2) THEN 28

A.5.5 SS Test Modes

Table A.128—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.6 Base Station

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

Prerequisite: A.2/2 Base Station

A.6.1 Major BS Capabilities and Functionalities of the MAC

A.6.1.1 Convergence Sublayers

This subclause covers the requirements in Clause 5 of IEEE 802.16.

A.6.1.1.1 ATM Convergence Sublayer

This subclause covers the requirements of 5.1 of IEEE 802.16.

Table A.129—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	o	
6	CCS connection setup	5.1.2.4	c1	

c1: IF A.129/5 THEN m ELSE x

A.6.1.1.2 Packet Convergence Sublayer

This subclause covers the requirements of 5.2 of IEEE 802.16.

Table A.130—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 A.130/3 THEN o ELSE i

c2: IF A.130/4 THEN o ELSE i

Table A.131—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.6.1.2 Addressing and Connections

This subclause covers the requirements of 6.2.1 of IEEE 802.16.

Table A.132—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.6.1.3 Construction and Transmission of MAC PDUs

This subclause covers the requirements of 6.2.3 of IEEE 802.16.

A.6.1.3.1 Conventions**Table A.133—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 A.134—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.6.1.3.3 SDU Fragmentation**Table A.135—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 FSN 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	Refrain from fragmenting on connections with fragmentation off	6.2.3.3	m	

A.6.1.3.4 Packing**Table A.136—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 A.136/3 THEN o ELSE n/a

A.6.1.3.5 CRC**Table A.137—CRC**

Item	Capability	Reference	Status	Support
1	Compute and add CRC	6.2.3.5	o	
2	Check CRC of MAC PDUs received on connection with CRC enabled and discard any MAC PDU that fails check	6.2.3.5	c1	

c1: IF A.137/1 THEN m ELSE n/a

A.6.1.4 Uplink Scheduling Service

This subclause covers the requirements of 6.2.5 of IEEE 802.16.

Table A.138—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.6.1.5 Bandwidth Allocation and Request Mechanism

This subclause covers the requirements of 6.2.6 of IEEE 802.16.

Table A.139—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	Unicast Polls	6.2.6.4.1	m	
8	Broadcasts Polls	6.2.6.4.2	o	
9	Multicast Polls	6.2.6.4.2	c1	
10	Accept Poll-me Bit	6.2.6.4.3	m	
11	Accept SI Bit	6.2.6.4.3	m	

c1: IF A.153/1 THEN m ELSE n/a

A.6.1.6 MAC Support of PHY Layers

This subclause covers the requirements of 6.2.7 of IEEE 802.16.

Table A.140—MAC Support of PHY Layers – BS

Item	Capability	Reference	Status	Support
1	FDD frame structure	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 frame structure	6.2.7.3	c3	
6	Downlink Map transmitted immediately following frame preamble	6.2.7.4	m	
7	Uplink Map transmitted immediately following DL-MAP	6.2.7.5	m	
8	BS supports operation with multiple SSs	6.2.7	m	

c1: IF (profP1f OR profP2f) THEN m ELSE n/a

c2: IF A.140/1 THEN m ELSE n/a

c3: IF (profP1t OR profP2t) THEN m ELSE n/a

c4: IF A.140/1 THEN o ELSE n/a

Table A.141—Map Relevance – BS

Item	Capability	Reference	Status	Support
1	Accommodate processing time of SSs when scheduling transmissions	6.2.7.6.1	m	
2	Accommodate round trip delay when scheduling transmissions	6.2.7.6.1	m	
3	Respect condition Allocation Start Time + Offset of Null IE in UL-MAP \leq 5000 Minislots	6.2.7.6.1	c1	
4	Respect condition Allocation Start Time + Offset of Null IE in UL-MAP \leq 5600 Minislots	6.2.7.6.1	c2	

c1: IF profP1 THEN m ELSE i

c2: IF profP2 THEN m ELSE i

A.6.1.7 Contention resolution

This subclause covers the requirements of 6.2.8 of IEEE 802.16.

There are no specific requirements on the BS.

A.6.1.8 Network Entry and Initialization

This subclause covers the requirements of 6.2.9 of IEEE 802.16.

Table A.142—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.6.1.8.1 Transmit Downlink Parameters

Table A.143—Transmit Downlink Parameters

Item	Capability	Reference	Status	Support
1	BS transmits DCD	6.2.9.2	m	

A.6.1.8.2 Transmit Uplink Parameters

Table A.144—Transmit Downlink Parameters

Item	Capability	Reference	Status	Support
1	BS transmits UCD	6.2.9.3	m	

A.6.1.8.3 Initial Ranging**Table A.145—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 after receiving RNG-REQ	6.2.9.5	m	
4	Command SS to use a different DL channel	6.2.9.6	m	
5	Capability to change operational DIUC to the one requested in RNG-REQ	6.2.9.10.1	m	
6	Use of Station Maintenance intervals after RNG-RSP received during initial ranging	6.2.9.10.1	m	

A.6.1.8.4 Negotiate Basic Capabilities**Table A.146—Negotiate Basic Capabilities**

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.6.1.8.5 SS Authorization**Table A.147—SS Authorization**

Item	Capability	Reference	Status	Support
1	BS performs authorization of SS	6.2.9.8	m	

A.6.1.8.6 Registration**Table A.148—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	

A.6.1.8.7 Establish IP Connectivity**Table A.149—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.6.1.9 Establish Provisioned Connections**Table A.150—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 time-out of DSA-RSP for pre-provisioned service flows	6.2.10	m	
4	BS honors SS DSx Flow Control limit	6.2.10	m	

A.6.1.10 Periodic Ranging

This subclause covers the requirements of 6.2.10 of IEEE 802.16.

Table A.151—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 with unsolicited RNG-RSP	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 DBPC-RSP message to command a DL burst profile change in response to a DBPC-REQ message	6.2.10	m	
6	Provide Station Maintenance Intervals	6.2.10	o	
7	Honor SS PHY Mode capabilities	6.2.10	m	
8	BS measures power and timing during ranging opportunities and detects deviations	6.2.10	m	

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

A.6.1.11 Update of Channel Descriptors

This subclause covers the requirements of 6.2.11 of IEEE 802.16.

Table A.152—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.6.1.12 Multicast Polling Groups**Table A.153—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 A.153/1 THEN m ELSE x

c2: IF A.153/1 THEN m ELSE n/a

A.6.1.13 Quality of Service

This subclause covers the requirements of 6.2.13 of IEEE 802.16.

A.6.1.13.1 Dynamic Service Flow Operations**Table A.154—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 AND A.129/5) THEN m ELSE x // only for SVCs and soft-PVCs

A.6.1.13.2 SS Initiated Dynamic Service Flow Creation**Table A.155—SS Initiated Service Flow Creation**

Prerequisite: A.154/2

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

A.6.1.13.3 BS Initiated Service Flow Creation**Table A.156—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.6.1.13.4 SS Initiated Dynamic Service Flow Change**Table A.157—SS Initiated Service Flow change**

Prerequisite: A.154/4

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

A.6.1.13.5 BS Initiated Service Flow Change**Table A.158—BS Initiated Service Flow 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.6.1.13.6 SS Initiated Service Flow Deletion**Table A.159—BS Initiated Service Flow Deletion**

Prerequisite: A.154/6

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

A.6.1.13.7 BS Initiated Service Flow Deletion**Table A.160—BS Initiated Service Flow Deletion**

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

A.6.1.14 BS PKM Functions

This subclause covers the requirements of Clause 7 of IEEE 802.16.

Table A.161—PKM Functions

Item	Capability	Reference	Status	Support
1	BS supports X.509 certificate validation	7.2.4	m	
2	BS supports AK generation	7.2.4	m	
3	BS supports Authorization procedure	7.2.5, 7.5.2	m	
4	BS supports TEK generation	7.2.2	m	
5	BS supports TEK exchange protocol	7.5.2	m	
6	BS supports MAC management message authentication	7.5.3	m	
7	BS supports PKM message authentication	7.5.3	m	
8	BS supports Static SAs	7.1.3	o	
9	BS supports Dynamic SAs	7.1.3	o	
10	BS supports dynamic SA mapping	7.1.4	c1	
11	BS supports TEK usage rules	7.4.1.5	m	
12	BS supports AK usage rules	7.4.1.3	m	

c1: IF A.161/9 THEN m ELSE n/a

Table A.162—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.6.1.15 Configuration File

This subclause covers the requirements of Clause 9 of IEEE 802.16.

Table A.163—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 configuration file	6.2.9.12	m	

A.6.1.16 Reset and De/Re-Register Commands**Table A.164—Reset and De/Re-Register Commands**

Item	Capability	Reference	Status	Support
1	Support RES-CMD protocol	6.2.2.3.22	m	
2	Support DREG-CMD protocol	6.2.2.3.26	m	

A.6.2 MAC PDU descriptions, seen from the BS

This subclause covers the requirements of the various PDU formats.

A.6.2.1 Headers and Subheaders

Table A.165—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 Subheader –Tx	6.2.2.2.1	m	
6	Support Fragmentation Subheader – 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 A.136/3 THEN m ELSE n/a

A.6.2.2 MAC Management PDUs

This clause 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 A.166—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 A.167—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	BCC Code Type – Tx	11.1.1.2	x	
7	BTC Row Code Type – Tx	11.1.1.2	o	
8	BTC Column Type – Tx	11.1.1.2	o	
9	BTC Interleaving Type – Tx	11.1.1.2	o	
10	Scrambler Seed – Tx	11.1.1.2	m	
11	Last Codeword Length – Tx	11.1.1.2	m	

A.6.2.2.2 DCD Message**Table A.168—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 A.169—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	
4	RS Parity Bytes – Tx	11.1.2.2	m	
5	BCC Code Type – Tx	11.1.2.2	x	
6	BTC Row Code Type – Tx	11.1.2.2	x	
7	BTC Column Type – Tx	11.1.2.2	x	
8	BTC Interleaving Type – Tx	11.1.2.2	x	
9	Last Codeword Length – Tx	11.1.2.2	m	
10	DIUC Mandatory Exit Threshold – Tx	11.1.2.2	m	
11	DIUC Minimum Entry Threshold – Tx	11.1.2.2	m	
12	Preamble Present – Tx	11.1.2.2	c1	

c1: IF (Preamble Present == TRUE) THEN m ELSE o

A.6.2.2.3 DL-MAP**Table A.170—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.6.2.2.4 UL-MAP**Table A.171—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.6.2.2.5 RNG-REQ**Table A.172—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.6.2.2.6 RNG-RSP**Table A.173—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.6.2.2.7 REG-REQ**Table A.174—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.6.2.2.8 REG-RSP**Table A.175—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	11.4.0	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.6.2.2.9 PKM-REQ/RSP**A.6.2.2.9.1 Security Association Add Parameters****Table A.176—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.6.2.2.9.2 Authorization Request Parameters**Table A.177—Authorization Request Parameters**

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

A.6.2.2.9.3 Authorization Reply Parameters**Table A.178—Authorization Request Parameters**

Item	Capability	Reference	Status	Support
1	Authorization-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.6.2.2.9.4 Authorization Reject Parameters**Table A.179—Authorization Reject Parameters**

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

A.6.2.2.9.5 Key Request Parameters**Table A.180—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.6.2.2.9.6 Key Reply Parameters**Table A.181—Authorization 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.6.2.2.9.7 Key Reject Parameters**Table A.182—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.6.2.2.9.8 Authorization Invalid Parameters**Table A.183—Authorization Invalid Parameters**

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

A.6.2.2.9.9 TEK Invalid Parameters**Table A.184—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.6.2.2.9.10 Authentication Information Parameters**Table A.185—Authentication Information Parameters**

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

A.6.2.2.10 DSA-REQ**Table A.186—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	
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 AND A.129/5) 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 A.187—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 RuleID – 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	m	
5	Protocol – Tx	11.4.9.3	m	
6	IP Masked Source Address – Tx	11.4.9.3	c1	
7	IP Destination Address – Tx	11.4.9.3	c1	
8	IP Masked Source Address – Tx	11.4.9.3	c1	
9	IP Destination Address – Tx	11.4.9.3	c1	
10	Protocol Source Port Range – Tx	11.4.9.3	c1	
11	Protocol destination Port Range – Tx	11.4.9.3	c1	
12	Ethernet Destination MAC Address – Tx	11.4.9.3	c2	
13	Ethernet Source MAC Address – Tx	11.4.9.3	c2	
14	Ethertype/IEEE 802.2 SAP – Tx	11.4.9.3	c2	
15	IEEE 802.1D User_Priority – Tx	11.4.9.3	c3	
16	IEEE 802.1Q VLAN_ID – Tx	11.4.9.3	c3	
17	Associated Payload Header Suppression Index – Tx	11.4.9.3	c4	
18	Vendor Specific Classifier Parameters – Tx	11.4.9.3	o	
19	Payload Header Suppression Rule – Tx	11.4.9.3	c4	
20	Payload Header Suppression Index – Tx	11.4.9.3	c4	
21	Payload Header Suppression Field – Tx	11.4.9.3	c4	
22	Payload Header Suppression Mask – Tx	11.4.9.3	c4	
23	Payload Header Suppression Size – Tx	11.4.9.3	c4	
24	Payload Header Suppression Verification – Tx	11.4.9.3	c4	
25	Vendor Specific PHS Parameters – Tx	11.4.9.3	c5	

c1: IF A.130/2 OR A.130/6 OR A.130/8 THEN m

c2: IF A.130/3 THEN m ELSE n/a

c3: IF A.130/4 THEN m ELSE n/a

c4: IF A.131/1 THEN m ELSE n/a

c5: IF A.131/1 THEN o ELSE n/a

// IPv6

// Ethernet

// VLAN

// PHS

// PHS

Table A.188—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	
4	ATM Classifier Rule – Tx	11.4.9.4	m	

A.6.2.2.11 DSA-RSP**Table A.189—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 AND A.129/5) THEN m ELSE x // only for SVCs and soft-PVCs

Table A.190—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	c1	
6	Errored Parameter (PHS) – Rx	11.4.9.3	c1	
7	Error Code (PHS) – Rx	11.4.9.3	c1	
8	Error Message (PHS) – Rx	11.4.9.3	c1	

c1: IF A.131/1 THEN m ELSE n/a // PHS

Table A.191—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	
4	ATM Classifier Rule	11.4.9.4	n/a	

A.6.2.2.12 DSA-ACK**Table A.192—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 AND A.129/5) THEN m ELSE x // only for SVCs and soft-PVCs

A.6.2.2.13 DSC-REQ

Table A.193—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	
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	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 AND A.129/5) THEN m ELSE x
c2: IF (Service Flow Scheduling Type = BE) THEN o
ELSE n/a

// only for SVCs and soft-PVCs
// only for best effort services

Table A.194—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	m	
5	Protocol – Tx	11.4.9.3	m	
6	IPv4 Masked Source Address – Tx	11.4.9.3	m	
7	IPv4 Destination Address – Tx	11.4.9.3	m	
8	IPv6 Masked Source Address – Tx	11.4.9.3	c1	
9	IPv6 Destination Address – Tx	11.4.9.3	c1	
10	Protocol Source Port Range – Tx	11.4.9.3	m	
11	Protocol Destination Port Range – Tx	11.4.9.3	m	
12	Ethernet Destination MAC Address – Tx	11.4.9.3	c2	
13	Ethernet Source MAC Address – Tx	11.4.9.3	c2	
14	Ethertype/IEEE 802.2 SAP – Tx	11.4.9.3	c2	
15	IEEE 802.1D User_Priority – Tx	11.4.9.3	c3	
16	IEEE 802.1Q VLAN_ID – Tx	11.4.9.3	c3	
17	Associated Payload Header Suppression Index – Tx	11.4.9.3	c4	
18	Vendor Specific Classifier Parameters – Tx	11.4.9.3	o	
19	PHS Change Action	11.4.9.3	c4	
20	Payload Header Suppression Rule – Tx	11.4.9.3	c4	
21	Payload Header Suppression Index – Tx	11.4.9.3	c4	
22	Payload Header Suppression Field – Tx	11.4.9.3	c4	
23	Payload Header Suppression Mask – Tx	11.4.9.3	c4	
24	Payload Header Suppression Size – Tx	11.4.9.3	c4	
25	Payload Header Suppression Verification – Tx	11.4.9.3	c4	
26	Vendor Specific PHS Parameters – Tx	11.4.9.3	c5	
27	Dynamic Service Change Action (classifiers) – Tx	11.4.9.3	m	
28	Dynamic Service Change Action (PHS Rules) – Tx	11.4.9.3	c4	

c1: IF A.130/2 OR A.130/6 OR A.130/8 THEN m

c2: IF A.130/3 THEN m ELSE n/a

c3: IF A.130/4 THEN m ELSE n/a

c4: IF A.131/1 THEN m ELSE n/a

c5: IF A.131/1 THEN o ELSE n/a

// IPv6

// Ethernet

// VLAN

// PHS

// PHS

Table A.195—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	
4	ATM Classifier Change Action	11.4.9.4	m	
3	ATM Classifier Rule	11.4.9.4	m	

A.6.2.2.14 DSC-RSP**Table A.196—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 AND A.129/5) THEN m ELSE x // only for SVCs and soft-PVCs

Table A.197—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	m	
5	PHS Error Parameter Set – Rx	11.4.9.3	c1	
6	Errored Parameter (PHS) – Rx	11.4.9.3	c1	
7	Error Code (PHS) – Rx	11.4.9.3	c1	
8	Error Message (PHS) – Rx	11.4.9.3	c1	

c1: IF A.131/1 THEN m ELSE n/a

// PHS

Table A.198—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	
4	ATM Classifier Change Action	11.4.9.4	n/a	
5	ATM Classifier Rule	11.4.9.4	n/a	

A.6.2.2.15 DSC-ACK**Table A.199—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 AND A.129/5) THEN m ELSE n/a // only for SVCs and soft-PVCs

A.6.2.2.16 DSD-REQ**Table A.200—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 AND A.129/5) THEN m ELSE x // only for SVCs and soft-PVCs

A.6.2.2.17 DSD-RSP**Table A.201—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 AND A.129/5) THEN m ELSE x // only for SVCs and soft-PVCs

A.6.2.2.18 MCA-REQ**Table A.202—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 A.153/1 THEN m ELSE x

A.6.2.2.19 MCA-RSP**Table A.203—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.6.2.2.20 DBPC-REQ**Table A.204—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.6.2.2.21 DBPC-RSP**Table A.205—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.6.2.2.22 RES-CMD**Table A.206—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.6.2.2.23 SBC-REQ**Table A.207—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.6.2.2.24 SBC-RSP**Table A.208—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	x	

A.6.2.2.25 CLK-CMP**Table A.209—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.6.2.2.26 DREG-CMD**Table A.210—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.6.2.2.27 DSX-RVD**Table A.211—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 A.129/5 THEN m ELSE x

A.6.2.2.28 TFTP-CPLT**Table A.212—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.6.2.3 TFTP-RSP**Table A.213—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.6.2.4 ATM CS PDUs**Table A.214—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.6.2.5 Packet CS PDUs**Table A.215—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 Clause 10 and Clause 11 of IEEE 802.16.

A.6.3.1 Parameters and Constants

This subclause covers the requirements of Clause 10 of IEEE 802.16.

A.6.3.1.1 Global Values**Table A.216—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 A.217—BS Global Parameters Local Support

Item	Capability	Reference	Status	Support	Values	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	
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	

Table A.217—BS Global Parameters Local Support (continued)

Item	Capability	Reference	Status	Support	Values	Values Supported
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		3 s	
23	T13	10.1	m		15 min	

c1: IF (profP1 OR profP2) THEN 1 ms

c2: IF (profM1) THEN 1595 minislots ELSE IF (profM2) THEN 1295 minislots
ELSE 4096 minislots.

c3: IF (profP1 OR profP2) THEN 2

c4: IF (profP1 OR profP2) THEN n/a ELSE m.

A.6.3.1.2 PKM Parameter Values

Table A.218—BS PKM Parameters Local Support

Item	Capability	Reference	Status	Support	Values	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.6.3.1.3 10–66 GHz PHY Specific Values

Table A.219—BS PHY-Specific Parameters Support

Item	Capability	Reference	Status	Support	Values	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.6.3.1.4 Well Known Addresses and Identifiers

Table A.220—BS Well Known CIDs

Item	Capability	Reference	Status	Support	Values	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..0xFFFF	
6	Broadcast CID	10.4	m		0xFFFF	

c1: IF (A.139/11) THEN m ELSE n/a

A.6.3.2 MAC Management Message Encodings

A.6.3.2.1 UCD Message Encodings

Table A.221—BS UCD Channel Encodings Support

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Burst descriptor	11.1.1.1	m		See A.222	
2	Symbol Rate	11.1.1.1	x			
3	Frequency	11.1.1.1	x			
4	SS Transition Gap	11.1.1.1	m		≥ 6 PS	
5	Roll-off Factor	11.1.1.1	x		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 A.222—BS UCD Burst Profile Encodings Support

Item	Capability	Reference	Status	Support	Values	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	x		1	
7	BTC Row Code Type	11.1.1.2	o			
8	BTC Column Code Type	11.1.1.2	o			
9	BTC Interleaving Type	11.1.1.2	o			
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.6.3.2.2 DCD Message Encodings

Table A.223—BS DCD Channel Encodings Support

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Burst Descriptor	11.1.2.1	m		See A.224	
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 OR profP2t) THEN 0
ELSE IF (profP2f OR profP2f) THEN 1

Table A.224—BS DCD Burst Profile Encodings Support

Item	Capability	Reference	Status	Support	Values	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 Row Code Type	11.1.2.2	o			
7	BTC Column Code Type	11.1.2.2	o			
8	BTC Interleaving Type	11.1.2.2	o			
9	Last Codeword Length	11.1.2.2	m		c1	
10	DIUC Mandatory Exit Threshold	11.1.2.2	m			
11	DIUC Minimum Entry Threshold	11.1.2.2	m			
12	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 A.225—BS RNG-REQ Encodings Support

Item	Capability	Reference	Status	Support	Values	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 A.226—BS RNG-RSP Encodings Support**

Item	Capability	Reference	Status	Support	Values	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 override	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		0 x 0001.. m	
10	Primary Management CID	11.1.3	m		m + 1.. 2 m	

A.6.3.2.5 MCA-REQ Message Encodings**Table A.227—BS MCA-REQ Encodings Support**

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Multicast polling CID	11.1.5	c1		0 x FF00.. 0 x FFFE	
2	Assignment	11.1.5	c1		0..1	

c1: IF A.153/1 THEN m ELSE n/a

A.6.3.3 PKM Message Encodings**Table A.228—PKM Message Encodings Support**

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Display-string – Rx	11.2.1	m			
2	Display-string – Tx	11.2.1	0			
3	Authorization-Key	11.2.2	m			
4	TEK	11.2.3	m			
5	Key-Lifetime	11.2.4	m			
6	Key-Sequence-Number	11.2.5	m		AK:0–15 TEK:0–3	
7	HMAC-Digest	11.2.6	m			
8	SAID	11.2.7	m			
9	TEK-Parameters	11.2.8	m			
10	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		0 x 000001 0 x 010001	
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 A.229—PKM Configuration Settings Support

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Authorize Wait Time-out	11.2.19	m		2–30s	
2	Reauthorize Wait Time-out	11.2.19	m		2–30s	
3	Authorization Grace Time	11.2.19	m		60s, 300–3024000s	
4	Operational Wait Time-out	11.2.19	m		1–10s	
5	Rekey Wait Time-out	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 11.4 of IEEE 802.16.

Table A.230—Common Encodings

Item	Capability	Reference	Status	Support	Values	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.6.3.4.1 SS Capabilities Encodings

This subclause covers the requirements of 11.4.1 of IEEE 802.16.

Table A.231—SS Capabilities Encodings

Item	Capability	Reference	Status	Support	Values	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		0 x 01, 0 x 03	
7	IP Version	11.4.1.7	m		0 x 01, 0 x 03	
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 A.153/1 THEN m ELSE n/a

A.6.3.4.1.1 SS PHY Parameter Encodings

Table A.232—SS PHY Parameter Encodings

Item	Capability	Reference	Status	Support	Values	Values Supported
2	10–66 GHz PHY SS Demodulator Types	11.4.1.2.1	m		0 x 03, 0 x 07	
3	10–66 GHz PHY SS Modulator Types	11.4.1.2.2	m		0 x 01, 0 x 03, 0 x 07	
4	10–66 GHz SS Downlink FEC Types	11.4.1.2.3	m		0 x 03, 0 x 07	
5	10–66 GHz SS Uplink FEC Types	11.4.1.2.4	m		0 x 03, 0 x 07	

A.6.3.4.2 Convergence Sublayer Capabilities Encodings

This subclause covers the requirements of 11.4.5 of IEEE 802.16.

Table A.233—Convergence Sublayer Capabilities Encodings

Item	Capability	Reference	Status	Support	Values	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 11.4.8 of IEEE 802.16.

Table A.234—Service Flow Encodings

Item	Capability	Reference	Status	Support	Values	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		$0 \times 00 - 0 \times 07$	
6	Traffic Priority	11.4.8.6	m		0–7	
7	Maximum Sustained Traffic Rate	11.4.8.7	m		$0 - (2^{32} - 1)$	
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	

Table A.234—Service Flow Encodings (continued)

Item	Capability	Reference	Status	Support	Values	Values Supported
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 A.235—Service Flow Error Parameters

Item	Capability	Reference	Status	Support	Values	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 11.4.9 of IEEE 802.16.

Table A.236—Convergence Sublayer Specific Service Flow Encodings

Item	Capability	Reference	Status	Support	Values	Values Supported
1	Convergence Sublayer Specification	11.4.9.1	m		c3, c4	
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

c3: IF profM1 THEN 0

c4: IF profM2 THEN 1–8

A.6.3.4.4.1 Packet CS Encodings

This subclause covers the requirements of 11.4.9.3 of IEEE 802.16.

Table A.237—Packet CS Encodings

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values	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.6.3.4.4.1.1 Classifier Error Parameter Set**Table A.238—Classifier Error Parameters Set Parameters**

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values	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 – Rx	11.4.9.3	m			
4	Error Message –Tx	11.4.9.3	m			

A.6.3.4.4.1.2 Packet Classification Rule Parameters**Table A.239—Packet Classification Rule Parameters**

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values	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			
10	Ethertype/IEEE 802.2 SAP	11.4.9.3	c2			
11	IEEE 802.1D User Priority	11.4.9.3	c3			

Table A.239—Packet Classification Rule Parameters (continued)

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values	Values Supported
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 – Rx	11.4.9.3	c5			
20	Error Message – Tx	11.4.9.3	c6			

c1: A.130/(1, 2, 5, 6, 7, OR 8) THEN m ELSE n/a // IP
 c2: IF A.130/(3, 4, 5, 6, 7, OR 8) THEN m ELSE n/a // Ethernet
 c3: IF A.130/(4, 7, OR 8) THEN m ELSE n/a // VLAN
 c4: IF A.131/1 THEN m ELSE n/a // PHS
 c5: IF A.131/1 THEN m ELSE n/a
 c6: IF A.131/1 THEN o ELSE n/a

A.6.3.4.4.1.3 Payload Header Suppression Rule Parameter Set**Table A.240—Classifier Error Parameters Set Parameters**

Prerequisite profM2

Item	Capability	Reference	Status	Support	Values	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 11.4.9.4 of IEEE 802.16.

Table A.241—ATM CS Encodings

Prerequisite profM1

Item	Capability	Reference	Status	Support	Values	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			
4	ATM Classifier		m			
5	ATM Classifier ID		m			
6	ATM Classifier DSC Action.		m			

A.6.4 Major BS Capabilities and Functionalities of the PHY

This subclause covers the requirements of Clause 10 and Clause 11 of IEEE 802.16.

A.6.4.1 Multiplexing and Multiple Access Schemes

This subclause covers the requirements of 8.2 of.

Table A.242—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 A.242—Multiplexing and Multiple Access – BS (continued)

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 A.242/1 THEN m ELSE n/a

A.6.4.2 Downlink Physical Layer

This subclause covers the requirements of 8.2.5 of IEEE 802.16.

Table A.243—Downlink Physical Layer – BS

Item	Capability	Reference	Status	Support	Values	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 symbols	
13	Burst preamble	8.2.5	c1		16 symbols	
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.6.4.3 Uplink Physical Layer

This subclause covers the requirements of 8.2.6 of.

Table A.244—Uplink Physical Layer – BS

Item	Capability	Reference	Status	Support	Values	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.6.4.4 Baud Rates and Channel Widths

This subclause covers the requirements of 8.2.7 of IEEE 802.16.

Table A.245—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.6.4.5 Radio Subsystem Control

This subclause covers the requirements of 8.2.8 of IEEE 802.16.

Table A.246—Radio Subsystem Control – BS

Item	Capability	Reference	Status	Support	Values	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.6.4.6 Minimum Performance

This subclause covers the requirements of 8.2.9 of IEEE 802.16.

Table A.247—Minimum Tx Performance – BS

Item	Capability	Reference	Status	Support	Values	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	
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 with an equalizer for QPSK	8.2.9	m		10%	
10	Modulation accuracy when measured with an ideal receiver with an equalizer for 16-QAM	8.2.9	m		3%	
11	Modulation accuracy when measured with an ideal receiver with an equalizer for 64-QAM	8.2.9	m		1.5%	

Table A.248—Minimum Rx Performance – BS

Item	Capability	Reference	Status	Support	Values	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		$-94 + 10\log(c1)$ dBm	
3	BER performance threshold for 16-QAM, BER= 10^{-3}	8.2.9	m		$-87 + 10\log(c1)$ dBm	
4	BER performance threshold for 64-QAM, BER= 10^{-3}	8.2.9	m		$-79 + 10\log(c1)$ dBm	
5	BER performance threshold for QPSK, BER= 10^{-6}	8.2.9	m		$-90 + 10\log(c1)$ dBm	
6	BER performance threshold for 16-QAM, BER= 10^{-6}	8.2.9	m		$-83 + 10\log(c1)$ dBm	
7	BER performance threshold for 64-QAM, BER= 10^{-6}	8.2.9	m		$-74 + 10\log(c1)$ 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	
16	1 st adjacent channel interference at BER= 10^{-6} for 3 dB degradation C/I for 64-QAM	8.2.9	m		+9 dB	
17	1 st adjacent channel interference at BER= 10^{-6} for 1 dB degradation C/I for QPSK	8.2.9	m		-1 dB	

Table A.248—Minimum Rx Performance – BS (continued)

Item	Capability	Reference	Status	Support	Values	Values Supported
18	1 st adjacent channel interference at BER=10 ⁻⁶ for 1 dB degradation C/I for 16-QAM	8.2.9	m		+6 dB	
19	1 st adjacent channel interference at BER=10 ⁻⁶ for 1 dB degradation C/I for 64-QAM	8.2.9	m		+13 dB	
20	2 nd adjacent channel interference at BER=10 ⁻³ for 3 dB degradation C/I for QPSK	8.2.9	m		-34 dB	
21	2 nd adjacent channel interference at BER=10 ⁻³ for 3 dB degradation C/I for 16-QAM	8.2.9	m		-27 dB	
22	2 nd adjacent channel interference at BER=10 ⁻³ for 3 dB degradation C/I for 64-QAM	8.2.9	m		-20 dB	
23	2 nd adjacent channel interference at BER=10 ⁻³ for 1 dB degradation C/I for QPSK	8.2.9	m		-30 dB	
24	2 nd adjacent channel interference at BER=10 ⁻³ for 1 dB degradation C/I for 16-QAM	8.2.9	m		-22 dB	
25	2 nd adjacent channel interference at BER=10 ⁻³ for 1 dB degradation C/I for 64-QAM	8.2.9	m		-16 dB	
26	2 nd adjacent channel interference at BER=10 ⁻⁶ for 3 dB degradation C/I for QPSK	8.2.9	m		-30 dB	
27	2 nd adjacent channel interference at BER=10 ⁻⁶ for 3 dB degradation C/I for 16-QAM	8.2.9	m		-23 dB	
28	2 nd adjacent channel interference at BER=10 ⁻⁶ for 3 dB degradation C/I for 64-QAM	8.2.9	m		-16 dB	
29	2 nd adjacent channel interference at BER=10 ⁻⁶ for 1 dB degradation C/I for QPSK	8.2.9	m		-26 dB	
30	2 nd adjacent channel interference at BER=10 ⁻⁶ for 1 dB degradation C/I for 16-QAM	8.2.9	m		-20 dB	
31	2 nd 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.6.5 BS Test Modes

Table A.249—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 A.250—BS 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 SS at a fixed PHY mode (transmit and receive are independent), regardless of signal quality.		m	