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Re:	IEEE 802.16 WG Letter Ballot #31
Abstract	IEEE P802.16m/D4 should be improved through the identification of Implementation Conformance Statement (ICS) elements for normative content elements.
Purpose	For consideration in IEEE 802.16 WG Letter Ballot #31, and to encourage
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Implementation Conformance Statement (ICS) Content for 802.16m

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1. Introduction

External references (such as conformance documentation) to the detailed content of IEEE Draft P802.16m cannot easily be implemented because it is missing fixed, named hooks to the detailed normative elements. Without fixed named destinations, external references must resort to ambiguous references to the context by subclause and table numbers. However, such numbers are not fully specific, and they are not stable with respect to future maintenance actions. An example of the difficulties that will arise during later maintenance is documented in a liaison statement from ETSI BRAN ("Numbering in Revision 2 of IEEE 802.16 standard," IEEE L802.16-07/043). The request made in that liaison statement could not be accommodated, and the maintenance of the conformance documentation accordingly suffered severe disruption.

2. Need for ICS elements to be identified in draft

The solution to these problems is well known and is exemplified in see IEEE Std 802.3. There, normative clauses in the standard are followed by ICS proforma tables. The standard formulation of an ICS or PICS proforma is specified in ITU-T Recommendation X.296 ("OSI Conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Implementation conformance statements").

X.296 specifies the possibility of "mnemonic" names for ICS elements. This concept is adopted in IEEE Std 802.3, in which the normative elements are given such static names. For a good example, see Section 1, Subclause 18.5 ("Protocol implementation conformance statement (PICS) proforma for Clause 18, Fiber optic medium attachment unit, type 10BASE-FL").

When ICS elements are identified by static names, the normative content will be identified by pointers to specific subclause, table, figure, and equation numbers. Such numbers must be incorporated into the table by means of autonumbered cross-references. With this approach, normative content, with static naming, will survive from draft to draft, and the referenced content will continue to be correctly identified, even though the subclause, table, figure, and equation numbers vary from draft to draft and revision to revision.

3. Additional benefit of identifying normative content

Another issue with the draft standard is that the specific normative content of the text is, in some cases, difficult to identify with certainty.

The development of PICS proforma tables will provide assurance that the normative content of the draft is clearly denoted and understood. If it is not, those developing the tables will be stimulated to propose edits to address the problem.

4. Copyright Issue

As explained in ITU-T Recommendation X.296, “ICS proformas are to be completed by the implementors in the form published in the appropriate specification. This raises an issue of copyright with respect to the section of the specification containing the ICS proforma.” X.296 therefore recommends specific language for incorporation into the PICS documentation to ensure that it can be used appropriately. IEEE has acknowledged this need within its PICS standards. For example, 802.3 includes the following footnote on the title of the PICS subclauses: “Copyright release for PICS proformas: Users of this standard may freely reproduce the PICS proforma in this subclause so that it can be used for its intended purpose and may further publish the completed PICS.” By this means, IEEE has granted users rights to take advantage of the proforma. Virtually identical language appears in IEEE Std 802.16/ Conformance 01-2003 (“IEEE Standard for Conformance to IEEE 802.16 – Part 1: Protocol Implementation Conformance Statement (PICS) Proforma for 10–66 GHz WirelessMAN-SC Air Interface”).

5. Proposal

Include, in Clause 16, ICS proforma tables specified per ITU-T Recommendation X.296 and in the specific format represented in Annex 1.

In order to quickly advance the development of the appropriate tables, we recommended that Task Group m charter and appoint an ad hoc committee to oversee the drafting of such tables. Such a committee would be chartered not to make decisions regarding the normative content but simply to represent the content in the draft. However, the committee should also be requested to develop additional contributions identifying areas of the draft for which specific normative statements could not be created due to ambiguities or inconsistencies.

6. Annex 1

The table below illustrates an ICS table for P802.16m/D4. It address the Frame Structure specification, mainly in 16.3.3.1.

ICS ID	Capability	Reference-Subclause	Ref.-Table	Ref.-Table Row	Values or ICS IDs	Comment	Status for ABS	Status for AMS
ADPLX	Duplex Mode	16.3.3.1			ADPLXTDD ADPLXFDD		m	m
ADPLXTDD	Duplex Mode TDD	16.3.3.1					o	o
ADPLXFDD	Duplex Mode FDD	16.3.3.1					o	o
ADPLXHFDD	Half-duplex FDD	16.3.3.1					m: ADPLXFDD	m: ADPLXFDD
ADPLXFFDD	Full-duplex FDD	16.3.3.1					m: ADPLXFDD	o: ADPLXFDD
ABW	Channel Bandwidth	16.3.3.1			ABWT ABWF		m	m
ABWT	Channel Bandwidth-TDD	16.3.3.1			ABWT5 ABWT10 ABWT20 ABWT7 ABWT875		m: ADPLXTDD	m: ADPLXTDD
ABWT5	Channel Bandwidth-TDD – 5 MHz	16.3.3.1			5 MHz		o: ADPLXTDD	o: ADPLXTDD
ABWT10	Channel Bandwidth-TDD – 10 MHz	16.3.3.1			10 MHz		o: ADPLXTDD	o: ADPLXTDD

ABWT20	Channel Bandwidth-TDD – 20 MHz	16.3.3.1			20 MHz		o: ADPLXTDD	o: ADPLXTDD
ABWT7	Channel Bandwidth-TDD – 7 MHz	16.3.3.1			7 MHz		o: ADPLXTDD	o: ADPLXTDD
ABWT875	Channel Bandwidth-TDD – 8.75 MHz	16.3.3.1			8.75 MHz		o: ADPLXTDD	o: ADPLXTDD
ABWF	Channel Bandwidth-FDD	16.3.3.1			ABWF5 ABWF10 ABWF20 ABWF7 ABWF875		m: ADPLXFDD	m: ADPLXFDD
ABWF5	Channel Bandwidth-FDD – 5 MHz	16.3.3.1			5+5 MHz		o: ADPLXFDD	o: ADPLXFDD
ABWF10	Channel Bandwidth-FDD – 10 MHz	16.3.3.1			10+10 MHz		o: ADPLXFDD	o: ADPLXFDD
ABWF20	Channel Bandwidth-FDD – 20 MHz	16.3.3.1			20+20 MHz		o: ADPLXFDD	o: ADPLXFDD
ABWF7	Channel Bandwidth-FDD – 7 MHz	16.3.3.1			7+7 MHz		o: ADPLXFDD	o: ADPLXFDD
ABWF875	Channel Bandwidth-FDD – 8.75 MHz	16.3.3.1			8.75+8.75 MHz		o: ADPLXFDD	o: ADPLXFDD
ASUPFR	Superframe Duration	16.3.3.1			20 ms		m	m
ARADFR	Radio Frame Duration	16.3.3.1			5 ms		m	m
ACP	Cyclic Prefix Ratio G	16.3.2.3			ACP4 ACP8 ACP16		m	m
ACP4	Cyclic Prefix Factor G= 1/4				ACP4		o	o
ACP4	Cyclic Prefix Factor G= 1/8				ACP8		o	o
ACP4	Cyclic Prefix Factor G= 1/16				ACP16		o	o
ASAMFAC	Sampling factor	16.3.2.4	775		Per Table 775	{Editorial note: Table 777 needs row numbering}	m	m
ANFFT	FFT size	16.3.2.4	775		Per Table 775	{Editorial note: Table 777 needs row numbering}	m	m
ANUSED	Number of subcarriers used	16.3.2.4	775		Per Table 775	{Editorial note: Table 777 needs row numbering}	m	m
ASYM	Number of OFDMA symbols per Radio Frame	16.3.2.4	775		Per Table 775		m	m
ASWPTS	Number of switching point in TDD Radio Frame	16.3.3.1			2		m: DPLXTDD	m: DPLXTDD

AUHARQ	Supported number of UL HARQ Bursts per subframe	16.3.3.1			1,2,3,4	Support for all for is mandatory.	m	m
ADHARQ	Supported number of DL HARQ Bursts per subframe	16.3.3.1			1,2,3,4	Support for all for is mandatory.	m	m
ADHARQM	Shall not allocate more than 4 DL HARQ bursts per AAI subframe per AMS	16.3.3.1					m	N/A
ADALL	Maximum Number of concurrent DL allocations that are either group resource allocations or persistent allocations	16.3.3.1			2		m	N/A
AUALL	Maximum Number of concurrent UL allocations that are either group resource allocations or persistent allocations	16.3.3.1			2		m	N/A
ASFH	Every superframe shall contain a superframe header in the first DL subframe.	16.3.3.1					m	N/A

Note the format of the ICS ID. It also begins with “A.” This symbolizes the word “Advanced” and indicates that all elements in the table belong to the specification of the “Advanced” air interface in Clause 16; other ICS elements inserted into the standard would need a different initial letter.

After the “A” comes a mnemonic alphanumeric combination to represent the root feature. For example, “DPLX” represents Duplex Mode and “BW” represents Channel Bandwidth. Additional alphanumeric combinations are added to represent subsets.

As can be seen, specific normative statements are in some cases scattered throughout several subclauses. Therefore, it may be appropriate to develop the ICS content in a single integrated section of the draft, rather than attaching separate segments to each subclause.

A system must be developed to ensure the identifiers are unique, are not repeated within a draft, and are not reused in a later draft or revision once deleted.