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Title	**Enhancements to reporting structures within WirelessMAN-CX**
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Re:	Call for Contributions, IEEE 802.16h Task Group on License-Exempt Coexistence, IEEE 802.16h-06/005
Abstract	This document contains suggested enhancements to the working draft and base standard to facilitate a framework from which MAC enhancements for license-exempt and uncoordinated system operation can be developed.
Purpose	
Notice	
Release	
Patent Policy and Procedures	

Enhancements to reporting structures within WirelessMAN-CX

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Overview

This document describes enhancements to reporting structures for WirelessMAN-CX operation in the 802.16h working document [1] providing modification of 802.16-2004 standard [2] and facilitating license-exempt and uncoordinated band operation. Specifically the enhancements are defined as follows:

- Refinement to the extended reporting structure and the ability to report on specific spectrum users.
- Addition of a flow chart for operation in bands where specific spectrum users are present.

Specific editorial changes

This section provides a list of changes to the draft document.

Blue text represents specific editorial additions.

~~Red strikethrough~~ text is to be deleted.

Black text is text already in the draft.

Bold italic text is editorial instructions to the editor.

Changes to MAC common part sublayer

Add the following text at the end of section 6.3.15.1.

Figure [abcd] provides a flowchart representation of a generic scheme for operation in bands with specific spectrum users. WirelessMAN-CX provides enhanced reporting for specific spectrum users and addresses the need in situations where more than one type of specific spectrum user is operational in a given band.

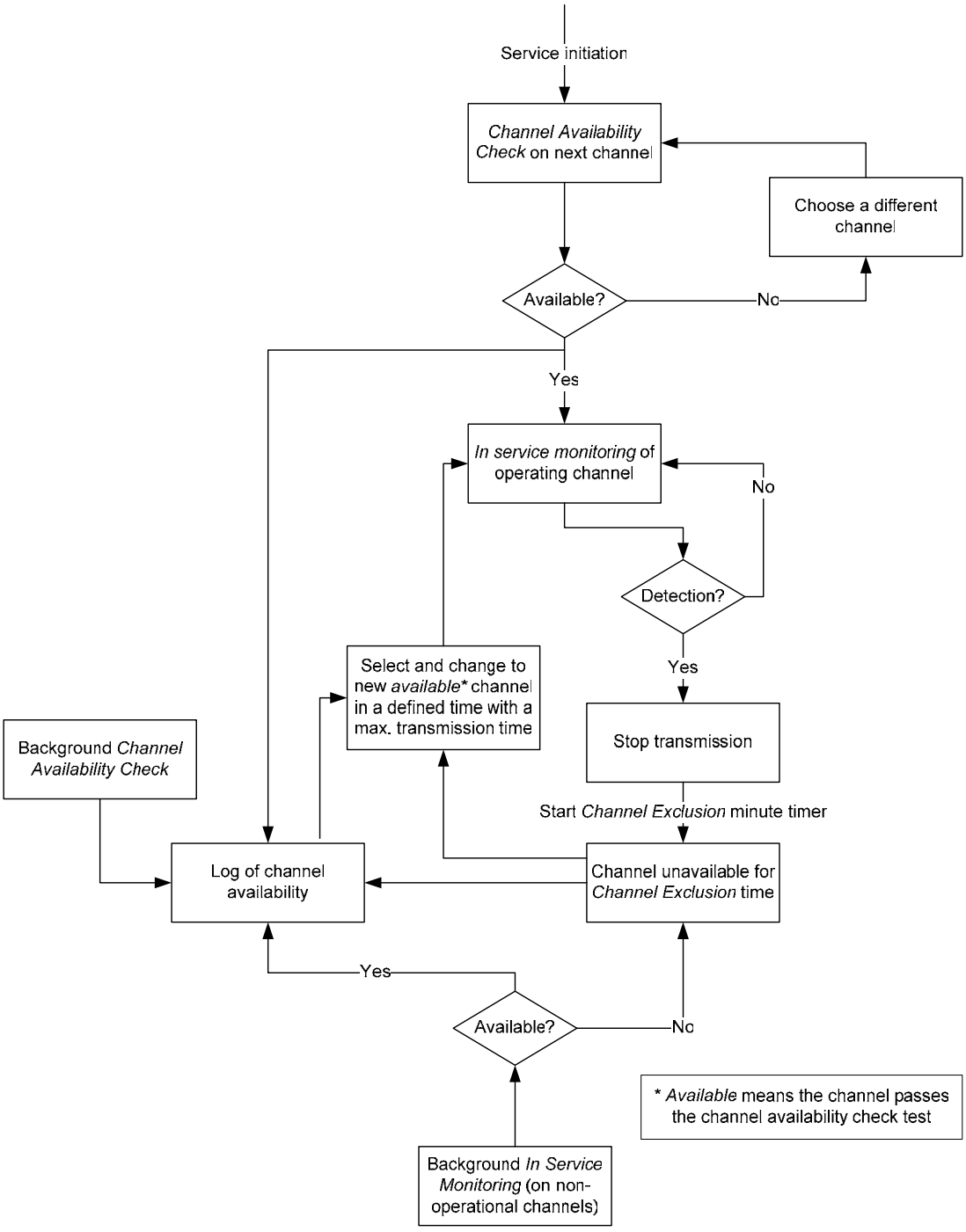

Figure [abcd] – Flowchart showing generic operation in bands with specific spectrum users

Modifications to 6.4 – MAC, and PHY support

Make the following changes to section 6.4.

6.4.1.3 Measurement and Reporting

License-exempt or uncoordinated bands are likely to present an operating environment that has a significantly higher and more dynamic interference profile than licensed bands. Measurement and reporting of the prevailing environment is therefore an important consideration for system operation and stability. Measurement and Reporting enhancements provide the ability to:

- Enhance details on environmental knowledge for license-exempt and uncoordinated band operation.
- Provide timely reports for fast link adaptation in an attempt to maintain BER performance.
- Provide bandwidth efficient reports maintain spectral efficiency but also to ensure interference reports are not out-of-date.
- Provide accurate measurements to retain WirelessMAN-CX integrity.
- Provide enhanced reporting for specific spectrum users.

Channel numbering structure and reporting

Make the following changes to the second table in section 11.11 (REP-REQ management message encoding)

Name	Type	Length	Value
ExChNr	1.10	2	Physical extended channel number (WirelessMAN-CX only)
Extended report type (WirelessMAN-CX only)	1.11	1	Bit #0 = 1: Include summary extended report ~~type A~~ Bit #1 = 1: Include full extended report ~~type B~~ Bit #2 = 1: Specific spectrum user extended report Bits #~~2~~3 - #7: *Reserved*

Make the following changes to the table in section 11.12 (REP-RSP management message encoding)

The extended report type consists of the following parameters.

REP-REQ Extended report type	Name	Type	Length	Value
Bit #0 = 1 OR Bit #1 = 1	*ExChNr*	1.1	2	Extended physical channel number to

OR Bit #2 = 1				be reported on.
Bit #0 = 1 OR Bit #1 = 1 OR Bit #2 = 1	Start frame	1.2	2	16 LSBs of Frame number in which measurement for this channel started
Bit #0 = 1 OR Bit #1 = 1 OR Bit #2 = 1	Duration	1.3	3	Cumulative measurement duration on the channel in multiples of Ts. For any value exceeding 0xFFFFFF, report 0xFFFFFF
Bit #0 = 1 ~~OR Bit #1 = 1~~	WirelessMAN-CX interference indicator	1.4~~2~~	1	Bit #0: Low interference indication Bit #1: Medium interference indication Bit #2: High interference indication Bit #3: ~~Primary~~ Specific spectrum user detected on the channel Bit #4: Channel not measured.
Bit #1 = 1	Zone specific CINR report	1.5~~3~~	2	1 byte: mean 1 byte: standard deviation
Bit #1 = 1	Zone specific RSSI report	1.6~~4~~	2	1 byte: mean 1 byte: standard deviation
Bit #1 = 2	Specific spectrum user detection report	1.7	1	Bit #0: Specific spectrum user type #0 Bit #1: Specific spectrum type #1 Bit #2: Specific spectrum type #2 Bit #3: Specific spectrum type #3 Bit #4: Specific spectrum type #4 Bit #5: Specific spectrum type #5 Bit #6: Specific spectrum not known Bit #7: Channel not measured

References

[1] IEEE 802.16h-06/004: *Part 16: Air Interface for Fixed Broadband Wireless Access Systems Amendment for Improved Coexistence Mechanisms for License-Exempt Operation*, Working document.

[2] IEEE 802.16-2004: *Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems*, October 2004.