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Re:	IEEE 802.16h-06/005 – Call for Contributions
Abstract	Fixes the addressed chapter
Purpose	
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High Level Introduction and some other changes

Mariana Goldhamer (Alvarion)

Introduction

- The Working Document needs a high-level presentation, as Introduction to Chap.15 and some notation changes, as detailed in this document. All the following text is intended to be introduced in the Working Document.

Text:

1. Overview

scope: This amendment specifies improved mechanisms, such as policies and medium access control enhancements, to enable coexistence among license-exempt systems based on IEEE Standard 802.16 and to facilitate the coexistence of such systems with primary users.

Applicability

applicability: This amendment improves the coexistence in the difficult interference environment~~,~~ characteristic for license-exempt operation. Some of the defined procedures may be optionally applied in any other cases, which require improved inter-system coexistence. ~~This amendment is applicable for un-coordinated frequency operation in all bands in which 802.16-2004is applicable, including bands allowing shared service.~~

Modify "applicability" cell in Table 1:

Applicability:
Below 11 GHz license-exempt or when needed for inter-system improved coexistence ~~and/or uncoordinated bands~~

3. Definitions

[Insert following sections after 3.85:]

3.86 WirelessMAN-CX: The designation used to describe the realization that adds co-existence procedures and recommended practice to systems implemented below 11GHz, in license-exempt ~~or uncoordinated~~ bands or whenever improved inter-system coexistence is needed. This designation is PHY ~~independent~~ independent. ~~and adds additional MAC functionality.~~ (comment: adds not only MAC functionality).

15.1 General

This chapter introduces high-level protocols and policies to be used for coordinating the system operation, with the scope to reduce the inter-system interference.
The basic mechanisms for achieving better coexistence are different for managed networks and for ad-hoc networks. It is recognized that the managed networks, generally deployed by operators, should receive a higher priority than the ad-hoc networks.
Are defined three basic mechanisms for achieving better coexistence:

- MAC Frame Synchronization, including Tx and Rx intervals;
- Adaptive Frequency Selection, for finding a less interfered or less used frequency;
- Separation of the remaining interference in the time domain, by using coordinated scheduling and a fairness approach.

For inter-system communication, at infrastructure and radio level, are defined IP-level messages, MAC-level messages and Cognitive Radio Signaling.

The communication at IP level is the most general one, being PHY independent. It allows distributed BS-BS communication as well as communication with a central database. The messages defined for such communication constitute the Coexistence Protocol.

The MAC-level messages are intended for systems using the same PHY profile. The may convey special information between the BS and its SS/MSS or may send messages between systems. In the last case, the communication takes place during the Coexistence Time Slot.

The Cognitive Radio Signaling uses elements of the existing PHY modes and allows simple communication between different systems. The Cognitive radio signaling may be used to communicate with ad-hoc systems, or to indirectly transmit the IP address during the CTS. These simple signals are selected in such a way, to allow in the future the extension of these procedures for communication with other systems, not belonging to IEEE 802.16 family.

The different system parameters, including their GPS coordinates, may be shared between systems, through distributed communication between Base Stations grouped in a Coexistence Neighborhood.

The level of interference and the interference source may be assessed using the Radio Signatures and the interferer identification procedures.

Interference-free sub-frames are initially allocated based on the selection of one of the possible rules, as agreed by operators. The Coexistence Protocol includes procedures, which allow the interference – free radio resource re-allocation. These procedures use credit tokens and negotiations, such that the interference-free resources may be dynamically sized in order to support the dynamic character of the traffic.

The protocols and policies described in this chapter enable the operation with reduced interference. The Coexistence Zone gives the support at the MAC level for scheduling the interference-free sub-frames.

15.2.1.1 General Principles

The approaches for interference resolution is based on separating the interference in the frequency and time domains.

~~***[call for suitable text here:]***~~

The separation of interference in the frequency domain is based on procedures named "Adaptive Channel Selection".

The separation of remaining interference, after applying the ACS procedures, is resolved by separation of interferers in time domain, by using procedures using the Coexistence Protocol. The Coexistence Protocol is defined at IP level and it is mainly intended for BS-BS communication.

In order to obtain the IP address of the Base Stations within the Interference Neighborhood, are defined a number of procedures, based on operator coordination or based on indirectly transmitting the IP address using the radio.

The operators can exchange tables including the deployment information, as GPS coordinates, and the IP address of the CX entity in the Base Station.

Operators may also maintain a common

~~***[call for high level description here of basic principles:]*** A possibility of 802.16h usage is in close relation with a~~ database, including both deployment information and an IP identifier for allowing the operation of a technology-independent

coexistence approach. In this case, it~~I~~t is assumed that:

Indications for the Editor

In Chap. 15.6:

- Delete the LE prefix in the CP message names, attributes, etc.

In Table h8:

- Change "MAC Message type" to "CP Message type";

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