Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Consideration on the community definitions**
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Re:	80216h-05_028：Call for Comments and Contributions: IEEE 802.16 License-Exempt Task Group (2005-12-15)
Abstract	It's necessary to refine the concept of community, we believe there is several types of community according to the previous meeting and discussion, co-channel community, location community, neighborhood community
Purpose	To refine the concept of community, to consolidate the terminology in further discussion.
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Consideration on the community definitions

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Overview

Based on the previous meeting and discussion, we find it necessary to separate and refine the concept of community into several distinguishing terms. These terms should be used precisely in different cases.

Reference:

[1]   *IEEE 802.16h-05/026: License-Exempt Task Group Meeting Minutes for Session #40 (2005-12-06)*

[2]   *IEEE 802.16-05/027: Working Document for P802.16h (2005-12-02)*

[3]   *IEEE C802.16h-05/042: ACS procedure in Coexistence Community(2005-11-08)*

Cases

In previous discussion and document, we find some different understanding of community:

Case 1)   Some of us thought the community is formed by centralized neighborhood of one coexistence network, which means formed by the air network of one base station and it's neighbors. *[Note: We need to be careful is that the neighbor referred here are also ambiguous. One possible understanding is the air network operating on co-channel and make/get interference in the air to/from the nearby air network, another understanding is the potential air network with qualified characteristic and location that could make/get interference in the air to/from the nearby air network if it operate on the co-channel.]*

Case 2)   In discussion of the resource allocation optimization, we use the concept of community as a collective of air network with adaptable channel allocation which are potential to make/get interference in the air to/from the initializing air network if it operates on the co-channel.

Case 3)   In discussion of the sub-frame allocation and negotiation, we may need the concept of community again, because all the cooperation should be done among the air networks is the co-channel, and only these air network can have the radio signaling exchange in the operating phase, we need a precise term and concept of these community in discussion in these topics for the implementation and simulation.

All these cases need to be support and clarified to distinguishing term.

Proposal

We proposed to separate and refine the concept and terms into the following manner:

1) Community is a generally referring to a collective which have a internal relationship between arbitrary two of the members(air networks), the co-community relationship between the members could be direct or successive.

2) There is two type of neighbor relationships(*neighborship*) which can build up two different concept/type of community, *co-channel neighbor relationship(co-channel neighborship)* and *location neighbor relationship(location neighborship)*. The first relationship goes to the air network operating on co-channel and make/get interference in the air to/from the nearby air network; the second one is to the potential air network with qualified characteristic and location that could make/get interference in the air to/from the nearby air network if it operates on the co-channel.

3) Referring to one particular community in the implementation or simulation, one community could only choose one of the two kind of relationship by cases. And the precise term of the two kind of community should be *co-channel community* (Case3) and *location community* (Case2). The first one is used to deal with the issue of co-operation among the air networks with fixed/selected channel; the second one is used to deal with the resource arrangement optimization in one area among the air network with adaptable channel.

4) The collective of coexistence of neighbors(Case1 in discussion) is also very important concept like community, it will be frequently used in discussion in the air signaling. Coexistence *neighborhood* is used to refer to the relationship between two coexistence neighbors(could be called as *neighborship* instead), if the group thought it's useless in the standard, we can use it as a short term of collective of coexistence neighbors. We also could choose another term to stand for the collective of coexistence neighbors, such as *neighboring collective* or *neighboring community*. While considering not to make more ambiguity into the term of community, we prefer to choose the first one. Whereas we still need to clarify the particular type of the relationship in implementation or simulation by co-channel or location*.

Proposed text changes

Change section 15.2.1.1 as indicate:

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:]*
[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. It is assumed that:
1) In some circumstances, there is country/region data base, which includes, for every Base Station:
    a. Operator ID
    b. Base Station ID
    c. Base Station GPS coordinates
    d. IP identifier
The local Radio Administration may use, for light licensing procedure, its own database, generally not including the Base Station ID and IP identifier information.
There is a Server that manage the write/reading of this Data Base, using the 802.16h standardized procedures; the Server and the country/region data base can be hosted by one of the operators or a trusted entity, like the local Radio Administration.
Otherwise, if the region/country database is not available, the base stations should try to find its neighbor and the community topology in a coordinatively distributed fashion.

2) Every Base Station includes a data base, open for ~~any~~ other Base Station <u>in the same community</u>; the BS data-base contains information necessary for spectrum sharing, and includes the information related to the Base station itself and the associated SSs; a Base Station and the associated SSs form a ~~System~~<u>system</u>. Other Base Stations can send queries related to the information in the database to the DRRM entity, located in a Base Station (see <u>Figure h14</u>).~~;~~ <u>The base station shall represent its system in the cooperation with other systems when communicating over the backbone. It's possible to use the subscriber station to relay the control messages in some situations. The base station locations may be registered by GPS or other positioning systems, however there is no need to register the subscriber locations;</u>

~~3)A community of BSs is formed in an ad-hoc mode; in this community are included Base Stations, if any two of the base stations form a neighborhood or have a successive neighborhood relationship between each other;every Base Station maintains the list of the Base Stations forming the community. Supplementary, when using the IP-based communication approach:~~
   ~~a.An SS will not communicate directly with a foreign BS in IP-based communication;~~
   ~~b.It is no need to register the SS location.~~

~~4)~~<u>3)</u>   All the Base Stations forming a community will have synchronized MAC frames and frame number.

~~5)~~<u>4)</u>   A community will be limited to a reasonable size; the size limitations and interactions between different coexistence neighborhoods: t.b.d.

~~6)~~<u>5)</u>   All Base Stations and their networks will as a first step seek the avoidance of co-channel utilization of the same spectrum, and will be equipped with a spectrum detection and monitoring capability which will allow this.

~~7)~~<u>6)</u>   All base stations are synchronized to a GPS clock. The start of all MAC frame and other transaction are referenced to the rising edge of this clock.

~~8)~~<u>7)</u>   All base stations and their networks, operating in the LE bands, will provide the opportunity to other non-IEEE 802.16h systems to communicate their coexistence requests to the IEEE 802.16h networks.

~~9)~~<u>8)</u>   The IEEE 802.16h systems will recognize the use of radar and other systems having higher priority to LE spectrum.

~~10)~~<u>9)</u>   Every network will have a guaranteed minimum access time for the interference free use of the radio resource, being able to receive with minimum interference and to transmit at the needed powers for allowing communication between its Base Station and the remote subscribers<u>.</u>

~~**Coexistence Neighbor (CoNBR) BSs**: The base stations could create interference to each other or that have valid SSs in the common coverage area are called Coexistence neighbor (CoNBR) BSs, and shall form a *coexistence neighborhood*.~~
~~There are 2 basic conditions to form a coexistence neighborhood:~~
   ~~1) Common coverage area: base stations need to be close enough in geography;~~
   ~~2) Valid SSs exist in the common coverage area: When SS transfer data with one BS at a time, it shall consider other BSs as an interference source at the same time.~~

~~**Coexistence Neighbor Networks**: Coexistence Neighbor BSs & their SSs are called Coexistence Neighbor Network, and shall form a network coexistence neighbor hood.~~
[To accept the harmonized definition made by the TG in the meeting.]