

Project	IEEE 802.16 Broadband Wireless Access Working Group		
Title	Interworking between Femtocell and WiMAX		
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Re:	TGm SDD: Femtocells; in response to the TGm Call for Contributions and Comments 802.16m-08/040 for Session 58		
Abstract	This contribution is a high level proposal for interworking between femtocell and WiMAX		
Purpose	To discuss and adopt the proposed text in the next revision of the 802.16m SDD.		
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Interworking between Femtocell and WiMAX

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NEC

1. Introduction

This contribution addresses the interworking between WiMAX femtocell BSs and WiMAX macrocell BSs. In particular, we focus on how WiMAX femtocell BS and WiMAX macrocell BS communicate with each other. We propose a scheme in which WiMAX femtocell BSs can communicate directly with WiMAX macrocell BSs to enable a quick response to interference conditions and exchange of resource allocation parameters.

2. Discussion

Femtocell networks are a wireless technology concept that can improve indoor coverage and capacity. A WiMAX femtocell BS needs to carefully balance its transmit power, which should be high enough to ensure good signal strengths for its subscribers, but not too high to avoid severe inference to other mobile station (MS)s, other femtocells and macro-cell BS.

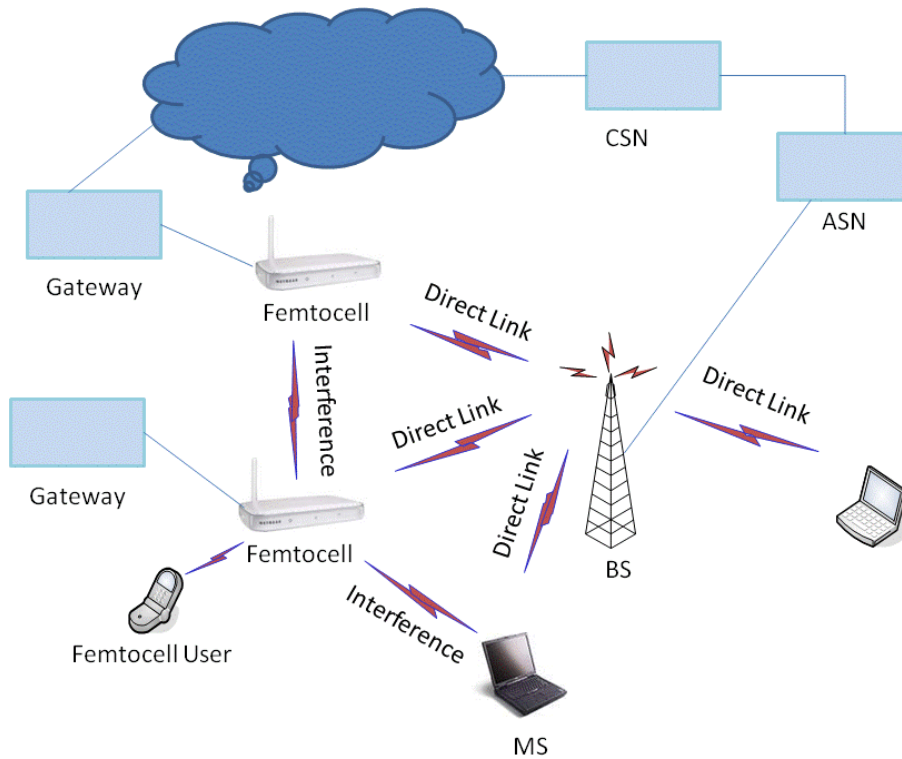
To address this problem, an interworking scheme between WiMAX femtocells and WiMAX macrocell networks is essential. Currently, the interworking between WiMAX femtocells and the WiMAX macro-cells is not defined in the IEEE 802.16 standards.

3. Direct Communication between Femtocell and WiMAX Macrocell BSs

We propose a method, which uses direct communication between WiMAX femtocell BSs and WiMAX macrocell BSs to enable a quick response to the interference condition and exchange of resource allocation parameters. It has the following features:

1. A WiMAX femtocell BS has a direct link with one or more WiMAX macro-cell BSs
2. A WiMAX femtocell BS only uses control/signalling channels for exchanging information to/from the WiMAX macrocell BS.
3. The WiMAX macrocell BS shall maintain the information related to each WiMAX femtocell within its coverage area which is updated periodically (preferably during off-peak hours).

4. Signaling information from macrocell BS to femtocell BS can include interference measurement, resource allocation information, parameters for coordination, etc.
 - An MS can scan the downlink channels. If it finds that the interference from a WiMAX femtocell BS is too high, it will report its measurement to the macrocell BS, and the latter will inform the femtocell BS to adjust its transmit power and/or spectrum allocation (e.g. use of subchannels) to reduce the co-channel interference. The macrocell BS may adjust its own subchannel assignment and/or transmit power.
5. Signaling information from femtocell BS to macrocell BS can include some feedback report on aggregate traffic utility/load in its cell, etc.



Insert the following text into the “Support for Femtocell” clause (IEEE 802.16m-08/003r5):

----- Proposed text -----

17 Support for Femtocell

17.x Interworking between Femtocell and WiMAX Macrocell

WiMAX Femocell BS may use direct link with other Femtocell BS and WiMAX macrocell BS.