Project	**IEEE 802.16 Broadband Wireless Access Working Group <**http://ieee802.org/16**>**
Title	**CR on SDD Section 17: Facilitating Entry of New Femto BS into the Network**
Date Submitted	**2009-02-24**
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Re:	Change request to Project 802.16m System Description Document (SDD) (IEEE 802.16m-08/003r7)
Abstract	This contribution provides text addition to SDD to facilitate entry of a new femto BS into the network.
Purpose	For discussion and approval by IEEE 802.16m TG
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Facilitating Entry of New Femto BS into the Network

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Resource Allocation on Entry of a New Femto BS

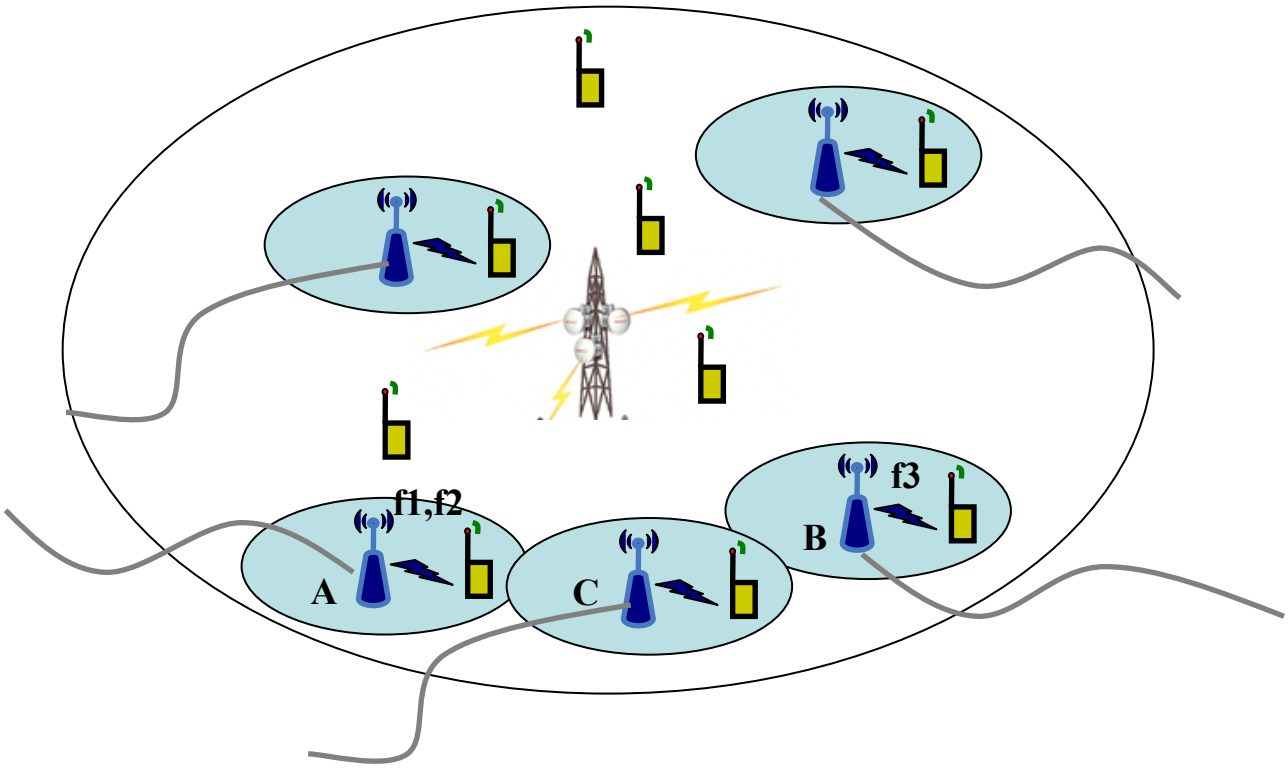

Figure 1. Femto/Macro Network Illustration.

It is often possible that the macro BS may not be able to coordinate resource allocation among femto cells and the femto BS have to autonomously determine their resource region. This is especially likely in moderate to high load scenarios. The SDD currently specifies that a femto BS will measure power on all carriers from neighboring femto/micro/macro BS and accordingly choose a carrier perceived to have low interference. However, in moderate to high load sceanrios, where the available resources are being utilized by existing femto BS, a new femto BS entering the network is likely to see high interference on all available resources from its neighboring femto/micro cells. This could potentially result in starvation of the new femto cell being deployed in the network. For eg., consider the scenario shown in Figure 1, where there are three carriers/channels available in the network: f1,f2 and f3. Femto BS A and B have already been deployed and split the resources as say f1+f2 for A and f3 for B. Now when the femto BS C gets deployed, it finds strong interference on all the available carriers from

its neighbors. This leads to starvation of the newly deployed femto BS C and its associated clients. This problem is exacerbated in cases, where there is no coordination of resources (to be used by the femto BS) by the macro BS and the femto BS have to autonomously determine their resource region of operation.

To address this starvation problem, it is essential for the femto BS to have the notion of “resource readjustment”. This essentially means that mechanisms for (centralized/distributed) resource allocation should be executed by the femto/macro BS either periodically or based on triggers (eg. entry of new femto BS), which would allow for resources to be shared fairly taking into account the change in network and load dynamics. In the above example, a periodic resource allocation mechanism would trigger the three femto BS to enter into a resource re-allocation phase, whereby the three frequencies would get shared as f1 for A, f2 for C and f3 for B respectively.

Insert the following text into the “Support for Femtocell” clause (IEEE 802.16m-08/003r7***):***

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

17.8 Interference Avoidance and Interference Mitigation

It is possible that when a new femto BS is initially deployed, all channels (carriers) could be occupied by neighboring femto/micro BS. In such scenarios, the new femto BS will see high interference level on all channels, resulting in its consequent starvation. To avoid such scenarios, which are common in moderate-high load conditions, mechanisms (centralized/distributed) for resource allocation at the femto/micro BS should be enabled either periodically or based on network triggers.

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