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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** |
| Title | ***Proposal for Small-Cell Backhaul (SCB) Project to Amend WirelessMAN-OFDMA*** |
| Date Submitted | **2012-07-11** |
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| Re: | Call for Contributions toward IEEE 802.16’s Session #80, IEEE 802.16’s HetNet Study Group (IEEE 802.16-12-0390-01-Gdoc). |
| Abstract | This document proposes a new project to amend IEEE Std 802.16-2012 in support of enhancements for Wireless Small Cell Backhaul (SCB) applications. It advocates that the HetNet Study Group issue a Call for Contributions regarding PAR development toward 802.16 Session #81, indicating an intent to complete a draft PAR at that session. It also requests that the Call for Contributions include a request for comments on draft PAR language based on that proposed here. This proposal also suggests that the HetNet Study Group request renewal through 802.16 Session #82 in November 2012 and seek to complete SCB PAR approval through the IEEE 802 process at that session. |
| Purpose | To advocate actions by the HetNet Study Group to proceed toward initiation of a Wireless Small Cell Backhaul amendment project, including issuing a Call for Contributions toward Session #81. Note: The contributors request that this proposal be addressed on 19 July, after work on topics carried forward from Session #80 is addressed. |
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Proposal for Small-Cell Backhaul (SCB) Project to Amend WirelessMAN-OFDMA

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# Abstract

This document proposes a new project to amend IEEE Std 802.16-2012 in support of enhancements for Wireless Small Cell Backhaul (SCB) applications. It advocates that the HetNet Study Group issue a Call for Contributions regarding PAR development toward 802.16 Session #81, indicating an intent to complete a draft PAR at that session. It also requests that the Call for Contributions include a request for comments on draft PAR language based on that proposed here. This proposal also suggests that the HetNet Study Group request renewal through 802.16 Session #82 in November 2012 and seek to complete SCB PAR approval through the IEEE 802 process at that session.

# Purpose

To advocate actions by the HetNet Study Group to proceed toward initiation of a Wireless Small Cell Backhaul amendment project, including issuing a Call for Contributions toward Session #81.

# Background

The IEEE 802.16 Working Group’s [HetNet Study Group](http://ieee802.org/16/sg/het) (SG) was initiated on 16 March 2012, initially through 20 July 2012. At the Study’s Group first meeting, during IEEE 802.16’s Session #79 of 14-17 May 2012, it considered two general topics:

(1) Multi-Tier networks, using an IEEE 802.16 air interface. These can be addressed amendments to existing 802.16 standards; in fact, the Study Group agreed to proceed in that direction by drafting the P802.16q PAR proposal in [IEEE 802.16-12-0394-00-Gdoc](https://mentor.ieee.org/802.16/dcn/12/16-12-0394), and

(2) Multi-RAT networks, with a focus on the Open Mobile Network Interface (OMNI) proposal that led to a 16 July tutorial and a Call for Contributions ([IEEE 802.16-12-0390-01-Gdoc](https://mentor.ieee.org/802.16/dcn/12/16-12-0390)).

The current proposal covers material that, while not specifically solicited in the Call for Contributions, is nevertheless within the scope of the HetNet Study Group. While distinct from (1) and (2), it addresses a related topic.

# Need for Small-Cell Backhaul (SCB) Enhancements to WirelessMAN-OFDMA

This contribution addresses the topic of enhancements to WirelessMAN-OFDMA to address small-cell backhaul (SCB) applications. The market for such applications and the need for such enhancements is established in [IEEE 802.16-12-0451-00-Shet](https://mentor.ieee.org/802.16/dcn/12/16-12-0451) (“Need for Small-Cell Backhaul (SCB) Enhancements to WirelessMAN-OFDMA”).

# Project Proposal

In order to address the documented need for small-cell backhaul (SCB) enhancements to WirelessMAN-OFDMA, this contribution proposes a new project to amend IEEE Std 802.16-2012 in support of enhancements for Wireless Small Cell Backhaul (SCB) applications.

# Proposed Key PAR Elements

This contribution proposes the following draft content for key elements of the SCB PAR:

**Type of Project:** Amendment to IEEE Standard 802.16-2012

**2.1 Title:** Air Interface for Broadband Wireless Access Systems: Amendment for Small Cell Backhaul (SCB) Applications

**5.2.b. Scope of the project:** This project will develop an amendment specifying enhancements to the WirelessMAN-OFDMA air interface for effective use in small cell backhaul applications. It will focus on bands below 11 GHz, particularly below 6 GHz. It will add 256QAM, 512QAM, and 1024QAM options in both uplink and downlink, with 4x4 MIMO in both directions. Significantly latency improvements will be attained. The solution will be tailored to use in fixed deployment using the Ethernet Convergence Sublayer.

**5.5 Need for the Project:** As the spectral efficiency of wireless links approaches its theoretical limits, and with the data traffic requirements continuing to grow rapidly, cell density and cooperation among base stations must increase in order to further improve network capacity and efficiently manage radio resources. Multi-tier access network architecture consisting of macrocells and a variety of overlaid smaller cells provides an approach towards solving the problem, allowing low cost per bit and efficiently utilizing all spectral resources in the system. Some such systems will be deploying using radio access technology outside the realm of IEEE 802.16. In such cases, IEEE Std 802.16, as enhanced, can provide an excellent tool for providing wireless backhaul to the small cells, allowing them to be positioned for optimal performance without regarding to the availability of high-capacity wired backhaul.

# Study Group Renewal

In planning for Session #81, the WG should request renewal of the HetNet Study Group through Session #82 so the SG can carry forward the work of developing a PAR on SCB enhancements. The extension will also allow the SG to develop the OMNI PAR.

# Proposed Call for Contributions on SCB Enhancements

In planning for Session #81, the WG should presume that its request for renewal of the HetNet Study Group will be granted.

Annex 1 is a proposed a draft Call for Contributions to solicit input on SCB Enhancements to the HetNet Study Group at Session #81. It is suitable for release upon renewal of the SG (anticipated on 20 July).

# Proposal

We propose that a draft Call for Contributions be developed, based on Annex 1, and issued to solicit input on SCB Enhancements to the HetNet Study Group at Session #81, conditioned upon renewal of the SG.

Annex 1:

Proposed Draft Call for Contributions:

*Small-Cell Backhaul (SCB) Enhancements to WirelessMAN-OFDMA*

 HetNet Study Group

# Issued: 20 July 2012

[Note: Pending renewal of Study Group until November 2012.]

# Deadline: 12 September 2012 AOE

On 16 March 2012, the IEEE 802 Executive Committee chartered the Study Group on the WirelessMAN Radio Interface in Heterogeneous Networks ([HetNet Study Group](http://ieee802.org/16/sg/het)), under the IEEE 802.16 Working Group, through 20 July 2012. The SG met during the IEEE 802.16 Working Group’s Session #79 in May 2012 and again during Session #80 in July 2012. The SG’s documents are available at <<http://docii-het.wirelessman.org>>.

On 20 July 2012, the SG was renewed through 16 November 2012. It will meet again during IEEE 802.16 [Session #81](http://ieee802.org/16/meetings/mtg81) (17-20 September 2012 in Indian Wells, CA, USA) and [Session #82](http://ieee802.org/16/meetings/mtg82) (12-15 November 2012 in San Antonio, TX USA).

During Session #80, the SG reviewed input contributions regarding small-cell backhaul enhancements to WirelessMAN-OFDMA. Following review of those contributions, the SG hereby issues this Call for Contributions soliciting input documentation to progress the development of a Project Authorization Request (PAR) and Five Criteria Statement on *Small-Cell Backhaul (SCB) Enhancements to WirelessMAN-OFDMA*.

Such contributions will be addressed at Session #81, where the SG intends to develop the PAR and Five Criteria with the intent of presenting them for IEEE 802 approval in conjunction with Session #82.

Comments are also solicited on the following draft text for key elements of the PAR:

**Type of Project:** Amendment to IEEE Standard 802.16-2012

**2.1 Title:** Air Interface for Broadband Wireless Access Systems: Amendment for Small Cell Backhaul (SCB) Applications

**5.2.b. Scope of the project:** This project will develop and amendment specifying enhancements to the WirelessMAN-OFDMA air interface for effective use in small cell backhaul applications. It will focus on bands below 11 GHz, particularly below 6 GHz. It will add 256QAM, 512QAM, and 1024 QAM options in both uplink and downlink, with 4x4 MIMO in both directions. Significantly latency improvements will be attained. The solution will be tailored to use in fixed deployment using the Ethernet Convergence Sublayer.

**5.5 Need for the Project:** As the spectral efficiency of wireless links approaches its theoretical limits, and with the data traffic requirements continuing to grow rapidly, cell density and cooperation among base stations must increase in order to further improve network capacity and efficiently manage radio resources. Multi-tier access network architecture consisting of macrocells and a variety of overlaid smaller cells provides an approach towards solving the problem, allowing low cost per bit and efficiently utilizing all spectral resources in the system. The current IEEE Std 802.16 and the amendments under development do not address the requirements for radio resource management based on cooperation among base stations in a multi-tier access network architecture. This project will address these needs, enabling cost-effective improvements in system capacity and user quality of service with interoperable and efficient management of network resources, mobility, and spectrum.

Submit your contribution by the deadline abovefollowing the IEEE 802.16 Document Submission Instructions <http://ieee802.org/16/submit.html> using the File Code “Shet”.

For further information, contact the following:

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