Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>	
Title	**WirelessMAN-OFDMA RS Functional Categories**	
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Re:	Call for Technical Comments Regarding IEEE Project (IEEE 802.16j-07/019).	
Abstract	This contribution describes the PHY, MAC and RF OFDMA RS SYS profiles	
Purpose	To incorporate the proposed change into the P802.16j Baseline Document (IEEE 802.16j-06/026r4)	
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WirelessMAN-OFDMA RS Functional Categories

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Introduction

This contribution provides an informative summary of a set of minimal requirements for different functional categories of relay stations. This summary is intended to assist readers in their understanding of the application of the standard to these functional categories. Being informative, these summaries do not make any binding requirements upon the overall 802.16j standard

Statement of the Problem

The 802.16j standard draft outlines a wide set of mandatory and optional features designed to optimize the performance of WIMAX OFDMA networks that are utilizing relay stations. Considering the significant number of new features introduced, it is considered important to summarize these features against a set of functional categories.

Proposed Remedy

It is proposed to add an informative Appendix “Relay Station Functional Categories” to the 802.16j draft standard to inform readers of the minimal requirements that characterize certain functional categories. As an informative appendix, this information does not make any binding requirements.

Proposed Text Change

[Insert Appendix Section: Appendix 1: Relay Station Functional Categories]
Appendix 1 Relay Station Functional Categories

A1.1 Introduction
This Appendix provides an informative summary of a set of minimal requirements for different functional categories of relay stations. This summary is intended to assist readers in their understanding of the application of the standard to these functional categories.
These summary tables outline the minimal Relay Station features needed to support certain functional categories. The Relay Station features are summarized for a set of Relay Station categories. This appendix does not contain any binding specifications for the standard. The sets of requirements presented here are not to be considered exhaustive. Other sets of requirements could also be defined for other applications.

A1.2 OFDMA_MR_Centralized Non-Transparent 1

This sub-section summarizes the minimal set of requirements for a fixed Relay Station intended to operate under the following configuration:

MAC

- Centralized scheduler (C)
- Centralized security model (C)
- Topology Path Management

PHY

- Non-transparent Relay (NT)
- Multi-hop link (N>2)
- HARQ

Table xxx.1 lists the minimal capability requirements for the OFDMA MR CC_NT1 category.

Feature	Minimal Requirement	Conditions/Notes
MAC		
R-MAC header	No	
Tunnel support	No	
BW Request/Allocation: Centralized Distributed Dedicated Channel	Yes Yes No No	
MS network entry support	Yes	
RS Network entry Path Selection Parameter Configuration RS grouping	Yes No No No	
Security Features Centralized security model Distributed security model Security Zone Key	 Yes No No	Note#1
HARQ support for relay	No	
Mobility support for relay MS sleep mode MS idle mode MS handover Mobile RS handover	No No No No No	
MBS	No	
Topology/Path management Topology discovery Embedded Path Management Explicit Path Management	Yes Yes No No	
RS Neighbor Discovery	No	
Interference Measurement	No	
Location Report	No	

PHY		
Frame Structure		
Non-transparent Multi-frame	Yes	Recommended for frame code duration {4, 6,}
Non-transparent Partitioned frame structure	Yes	Recommended for frame code durations (8)
Transparent Frame Structure	No	Optional mode
Relay Ambles		
SYNC Amble max repetition rate duration	40 ms	
SYNC amble repetition rate	N	Configurable
Network synchronized frame number	Yes	
SYNC amble sequence A	Yes	
SYNC amble sequence B	Yes	Recommended only for number of hops >2
SCAN amble repetition rate L	L>=N	Configurable
Relay amble subcarrier modulation	Yes (#8.4.9.4.3.1.1)	Different modulations applied for 128, 512, 1k and 2k FFT
Relay amble PN sequence	Yes #8.4.6.1.1.3	The relay PN sequences for 128 and 512 are different than 1k and 2k FFT
Gaps		
RSRTG	>=50 µs	If existent
RSTTG	>= 1 symbol	If existent
Network Synchronization		
Network Synchronization	Yes	Sub-ordinated RS is synchronized on the starting symbol of the DL and UL sub-frames

Note#1: RS shares MS security context in a distributed security model, while RS does not in centralized security model.

A1.2 OFDMA_MR_Distributed Non-Transparent 1

This sub-section summarizes the minimal requirements for a fixed Relay Station intended to operate under the following configuration:

MAC

- Distributed scheduler
- Centralized security model
- Topology Path Management

PHY

- Non-transparent Relay
- Multi-hop link (N>2)
- HARQ
- SISO

The following table presents only the features that are different than those presented in Table xxx.1. The other features for this category are identical with those presented in Table xxx.1 and its associated notes.

Table xxx.2 lists the minimal capability requirements for the OFDMA MR DC_NT1 category.

Feature	Minimal Requirement	Conditions/Notes
MAC		

BW Request/Allocation:
  Centralized
  Distributed
  Dedicated Channel
	Yes
	No
	Yes
	No	

A1.3 OFDMA_MR_Distributed Non-Transparent 2

This sub-section summarizes the minimal requirements for a fixed Relay Station intended to operate under the following configuration:

MAC

- Distributed scheduler
- Distributed security model
- Topology Path Management

PHY

- Non-transparent Relay
- Multi-hop link (N>2)
- HARQ
- SISO

In the following table are presented only the features that are different than those presented in Table xxx.1. The other features for this category are identical with those presented in Table xxx.1 and its associated notes.

Table xxx.3 lists the minimal capability requirements for the OFDMA MR DD_NT1 category

Feature	Minimal Requirement	Conditions/Notes
MAC		

BW Request/Allocation:
  Centralized
  Distributed
  Dedicated Channel
	Yes
	No
	Yes
	No
		
		RS does not share MS security context.
		RS shares MS security context.

Security Features
  Centralized security model
  Distributed security model
  Security Zone Key
	
	No
	Yes
	No
		Note#2
		Distributed Security is only applicable to distributed BW request/allocation method.

Note#2: RS shares MS security context in distributed security model, while RS does not in centralized security model.