

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Proposed Technical Requirements for IEEE 802.16 TGj	
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Re:		
Abstract	This is a harmonized version of TGj requirements contributions (C802.16j-06/022r1 and C802.16j-06/016).	
Purpose	To serve a baseline for TGj requirement document	
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Proposed Technical Requirements for IEEE 802.16 TGj

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A design objective of the project is to maximize the reuse of 802.16e specification wherever possible.

1. High level requirements

Good performance for 2 hop case, but enable multihop case

Support for Multiple hops (range extension, terrain may require it in any usage model, fault tolerance/load balancing)

Support for Topologies with redundant paths

Flexible frequency usage – completely flexible allocation of frequencies to links

- Sharing channel between access link (i.e. BS-MS link) and MMR link (i.e. BS-RS link)
- Sharing channel between multiple MMR links
- Different channels for different links,
- Reusing same channel within cell (spatial multiplexing)

Centralized and distributed control

Support for LOS and NLOS MMR links

Support all QoS differentiation in traffic forwarding as defined in 802.16e specification

Support the same security level as in the system complying 802.16e specification

2. Example of functional requirements

The following table describes an example of what can be used as a starting point for the discussion on mandatory and optional functional requirements.

M: Mandatory function

O: Optional function

Category	Name	Requirements		M	O	Notes
Backward compatibility	Backward compatibility	The specification shall define the base station which is able to accommodate legacy 16 mobile stations as well as relay stations.				
Configuration	Neighbor detection	The specification shall define the relay station enables neighbor detection at initial entry.				
	Capability management	The specification shall define the procedures to negotiate the functionalities between base station and relay station.				
	Path selection metric	The specification shall define the metrics of data path establishment from base station to mobile station via relay station.	At least link selection mechanism based on channel measurement			
	Hop limit from BS to MS	The specification shall limit the maximum hop count from base station to mobile station via relay station.	2 hop			
N hop (only for fixed relay station)						
PHY features	PHY frame structure for backward compatibility with legacy 16 mobile station	The specification shall define a frame structure for the link between the base station and the relay station, while the frame structure satisfies the backward compatibility with legacy 16 system. The frame structure shall support both relay station and the legacy 16 station in the same frame. The frame structure shall support at least one between in-band relay and multi-band relay.				
	Preamble transmission	The specification shall define relay station which enables to transmit the preamble.				Not allowed in low capability relay
	FEC block processing	The specification shall define relay station which enables FEC block encoding/decoding.				
	Link adaptation mechanism	The specification shall define link adaptation function (e.g. adaptive modulation and coding scheme) in relay station.				
	Transmission power control	The specification shall enable transmission power control in relay station.				

Control information processing	System information	The specification shall define relay station which enables the neighbor information process.	MOB_NBR-ADV message re-broadcast		Not allowed in low capability relay	
			MOB_NBR-ADV message re-formation			
		The specification shall define relay station which enables the channel information process.	DCD/UCD message re-broadcast		Not allowed in low capability relay	
			DCD/UCD message re-formation			
	MAP information	The specification shall define relay station which enables the downlink or uplink MAP process.	DL/UL MAP message re-broadcast		Not allowed in low capability relay	
			DL/UL MAP message reformation			
UL ranging processing		The specification shall define relay station which enables to process UL ranging.			Not allowed in low capability relay	
Scheduling	Scheduler in relay station		The specification shall define relay station which enables to schedule packet transmission.			Scheduling in relay station shall be either coordinated at base station or distributed operation.
	ARQ processing		The specification shall define relay station which supports mobile station's ARQ operation.			
	HARQ processing		The specification shall define relay station which enables H-ARQ processing.			Not allowed in low capability relay.
Data delivery via relay	Unicast data delivery		The specification shall support unicast data delivery across the relay station.			
	Multicast/broadcast data delivery		The specification shall multicast or broadcast data delivery across the relay station.			Optional for low capability relay (directed by base station).
	MAC PDU processing		The specification shall deploy relay station which enables to configure MAC PDU.			

Mobility support	MS handover support	Relay station shall support the mobile station handover.	Handover negotiation message re-transmission		Optional for low capability relay (route change between relay stations within the same base station coverage)
			Handover negotiation control (i.e. handover triggering)		
	Mobile RS handover support	The specification shall support relay station with mobility.			
Security	Relay security	The specification shall utilize IEEE 802.16e security mechanism or extend it to support security between base station and relay station or between relay station and mobile station.			
	Authentication functionality in relay station	Relay station shall be able to authenticate the management messages of mobile stations which belong to it.			Not available in low capability relay

