Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	**A Flexible Multihop Relay Frame Structure for 802.16j**	
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Re:	Response to a call for technical proposal for the TG Relay.	
Abstract	A flexible multihop relay frame structure for 802.16j is submitted in this contribution.	
Purpose	Adopt this technical proposal as part of the baseline document.	
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A Flexible Multihop Relay Frame Structure for 802.16j

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1. Introduction

The Mobile Multi-hop Relay (MMR) modes to be defined in IEEE 802.16j need to be backward compatible with the published IEEE 802.16-2004 and IEEE 802.16e-2005 standards. It is desirable that no changes be made to an existing mobile station (MS) in order to work with a relay station (RS) and a MMR base station (MMR-BS). Various types of RS (Fixed RS, Nomadic RS, and Mobile RS) together with MMR-BS are to be defined in the IEEE 802.16j project Task Group (TGj). According to the IEEE 802.16j Project Authorization Request (PAR), the purpose of this amendment is to enhance coverage, throughput and system capacity of 802.16 networks by specifying 802.16 multihop relay capabilities and functionalities of interoperable relay stations and base stations.

2. Problem statement

By introducing MMR mode in the networks, we often have to compromise in the support of QoS due to extra delays caused by the relay stations. In order to maintain the same QoS for the overall IEEE 802.16 networks, the delay results from MMR relay stations must be minimized.

3. Proposed solutions

The same frame relay can minimize the delays introduced by the MMR relay stations, which will simplify the overall network QoS management. The same frame relay frame structure has been proposed in this contribution, the text is to be incorporated in the IEEE 802.16j draft document.

4. Specific text changes

*[Add a new section **8.4.4.8 Relay Frame Structure** as below]*

8.4.4.8 Relay Frame Structure

In each downlink subframe, BS transmission begins with a preamble followed by a DL-MAP and UL-MAP transmission. A relay station (RS) is expected to receive, decode, and transmit data bursts during the period of downlink subframe. The RS first receives data bursts from the BS, decode the data bursts within receive/transmit transition gap (RS-RTG), and transmit data bursts for its subordinate subscriber or relay stations. The same frame downlink relay is transmitted by the RS as parts of a downlink subframe.

Similarly a relay station is expected to receive, decode, and transmit data bursts during the period of uplink subframe. The RS first receives data bursts from its subordinate subscriber or relay stations, decode the data bursts within the RS-RTG, and transmit data bursts to the BS or a parent relay station. The same frame uplink relay is transmitted by the RS as parts of an uplink subframe.

In same frame relay, the RS-TTG and RS-RTG for the RS shall be satisfied to allow the RS to have enough time for the transitions between the transmission and reception during the downlink and uplink transmission period.

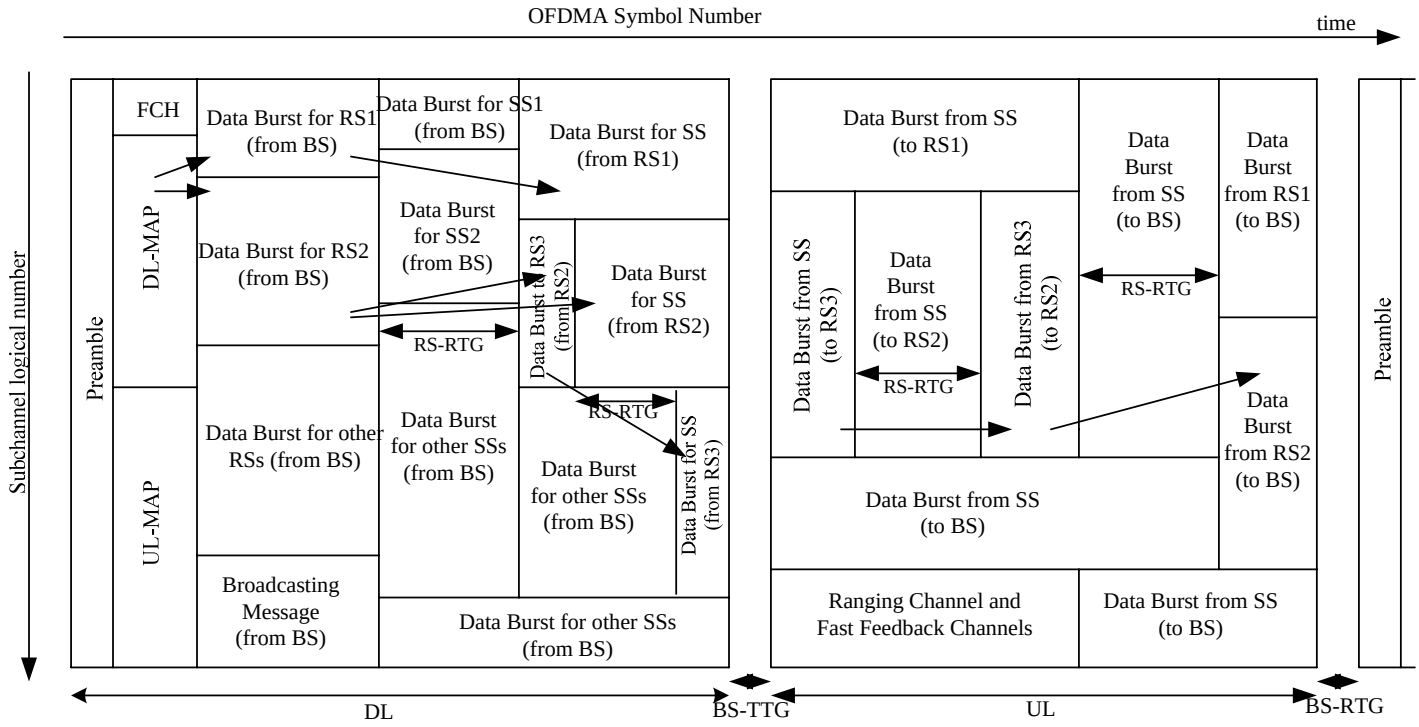

Figure218a Example of an OFDMA Frame (with only one mandatory zone) in TDD Mode