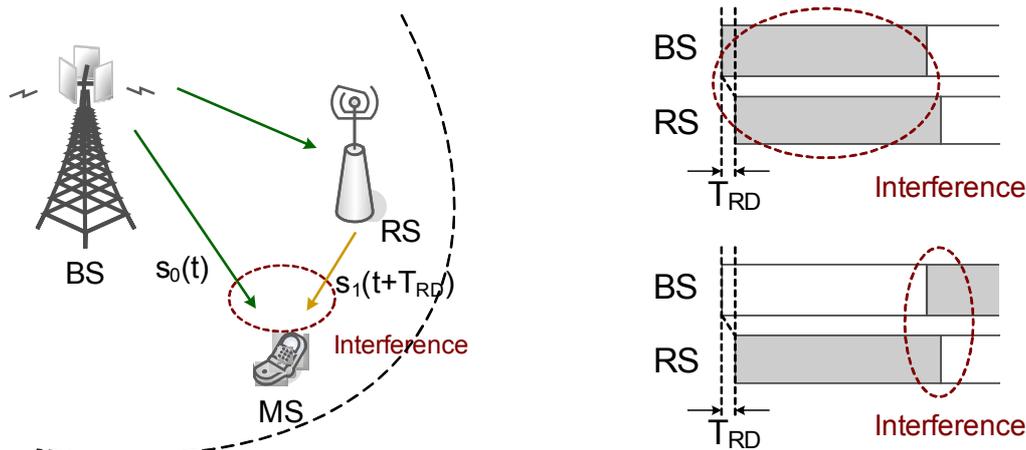


Project	<b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >	
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Re:	This is a response to Call for Technical Proposals regarding IEEE Project P802.16j.	
Abstract	The document contains technical proposals for IEEE P802.16j that would provide transmission timing requirement of RS.	
Purpose	The document is submitted for review by 802.16 Working Group members.	
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## Transmission timing requirement of RS

### 1 Introduction

In direct forward or multi-hop relay environment, transmission signals of multiple sources such as BS or RSs coexist at the same time. The transmission timing difference exists between RSs and BS because of physical delay elements such as analog filter, transmission delay, timing jitter, and etc. The transmission timing difference affect them each other as interference and prevent their reliable transmission. Therefore, the effect of the interference needs to be minimized.



**Figure 1. Example of transmission interference between BS and RS**

### 2 Solution

The maximum timing difference  $T_{RD}$  as the transmission timing requirement of RS need be defined to prevent interference between a relay signal and other relay signal or BS signal. If transmission timing differences of multiple signal sources are within CP period, the advantage of OFDMA system about multi-path would be able to transmit information without the interference. Therefore, maximum timing difference  $T_{RD}$  between RS and BS at final hop shall be met.

$T_{RD} < \text{Cyclic prefix duration}$ .

### 3. Text Proposals

#### In 8.4.10.1.x RS synchronization

At R-Link, all RSs shall acquire and adjust their timing such that all R-Link OFDMA symbols transmission time coincident at the BS to a accuracy within  $T_{RD}$ .

#### In 8.4.12.x Transmitter reference timing accuracy of RS

At the RS in the same way as MS, upon close-loop adjustments of transmit and receive timings from BS through CDMA ranging methods during network entry and periodic ranging, the RS obtains the system time reference. Thereafter, the RS shall compensate the time reference of BS transmission and maintain it.