Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	**MS Network Entry and Initial Ranging for RS Groups in Distributed Scheduling Mode**	
Date Submitted	**2008-01-21**	
Source(s)	Israfil Bahceci, Senarath Gamini, Peiying Zhu, Wen Tong, Derek Yu, Sun Sheng, Mark Naden Nortel Networks 3500 Carling Avenue Ottawa, Ontario K2H 8E9	Voice: +613-763-1315 E-mail: wentong@nortel.com E-mail: pyzhu@nortel.com
Re:	IEEE P802.16j/D2: IEEE 802.16j working group letter ballot #28a	
Abstract	MS Network entry procedures through RS group under distributed scheduling mode are proposed	
Purpose	To incorporate the proposed text into the P802.16j/D2 Baseline Document	
Notice	*This document does not represent the agreed views of the IEEE 802.16 Working Group or any of its subgroups*. It represents only the views of the participants listed in the "Source(s)" field above. It is offered as a basis for discussion. It is not binding on the contributor(s), who reserve(s) the right to add, amend or withdraw material contained herein.	
Release	The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.	
Patent Policy	The contributor is familiar with the IEEE-SA Patent Policy and Procedures: <http://standards.ieee.org/guides/bylaws/sect6-7.html#6> and <http://standards.ieee.org/guides/opman/sect6.html#6.3>. Further information is located at <http://standards.ieee.org/board/pat/pat-material.html> and <http://standards.ieee.org/board/pat>.	

MS Network Entry and Initial Ranging for RS Groups in Distributed Scheduling Mode

Israfil Bahceci, Senarath Gamini, Peiying Zhu, Wen Tong, Hang Zhang,Derek Yu, Sun Sheng, Mark Naden

Nortel Networks

Introduction

In 16j/D2, the initial ranging for RS group is described only for the case where super-ordinate station of the group is operated in centralized scheduling mode. This causes lots of overhead between MR-BS and the super ordinate RS because MR-BS has to control all the operations within the network and there are many messages sent to the MR-BS under this restriction. Therefore, we propose to reduce this overhead by allowing to operate the super-ordinate RS in distributed scheduling mode similar to the non-transparent RS with the distributed scheduler.

Description

In 16j/D2, MR-BS and RS behavior during contention based initial ranging is described in 6.3.10.3.1.1 for the following cases:

i. When an SS performs initial ranging in systems with transparent RSs attached to MR-BSs directly
ii. When an SS performs initial ranging in systems with transparent RSs attached to superordinate station as non-transparent RS with unique BSID operated in centralized scheduling mode
iii. When an SS performs initial ranging in systems with non-transparent RSs using shared BSIDs with other access stations
iv. When an SS performs initial ranging in systems using non-transparent RSs with unique BSIDs and centralized scheduling mode
v. When an SS performs initial ranging in systems using non-transparent RSs with unique BSIDs and RSs operating in distributed scheduling mode

Cases (ii) and (iii) apply to the MR networks having more than two hops between the MR-BS and MSs/SSs and the scheduling is centralized. However, it is clear that, in these two cases, centralized scheduling may have lots of overhead due to feedback requirements, e.g., CQI, channel state feedback, adjustment parameters, and due to the allocation of resources for transmitting the MAP information from MR-BS to the RS group members. Having a centralized scheduler at the MR-BS will consume significant amount resources at the relay link between the MR-BS and distributed mode RS. Therefore, it may be preferable to have a scheduler at the non-transparent RS which the transparent RSs (as in Case-ii) or the non-transparent RSs using the shared BSIDs (as in Case-iii) are attached to. The scheduling function and its complexity for the distributed mode RS of this case is similar to those of a non-transparent RS with distributed scheduling support and serving to non-transparent RSs (with unique BSIDs) also operated in distributed scheduler mode. On the other hand, the distributed mode RS for Cases (ii) and (iii) needs to prepare the MAP allocations also for its subordinate RSs' access zones. Whether or not the RS has such capability to perform distributed scheduling operations under this case can be indicated in REQ-REQ/REG-RSP message using the MR MAC feature support TLV. Thus, if an RS has capability, it can be configured as super-ordinate station to an RS group.

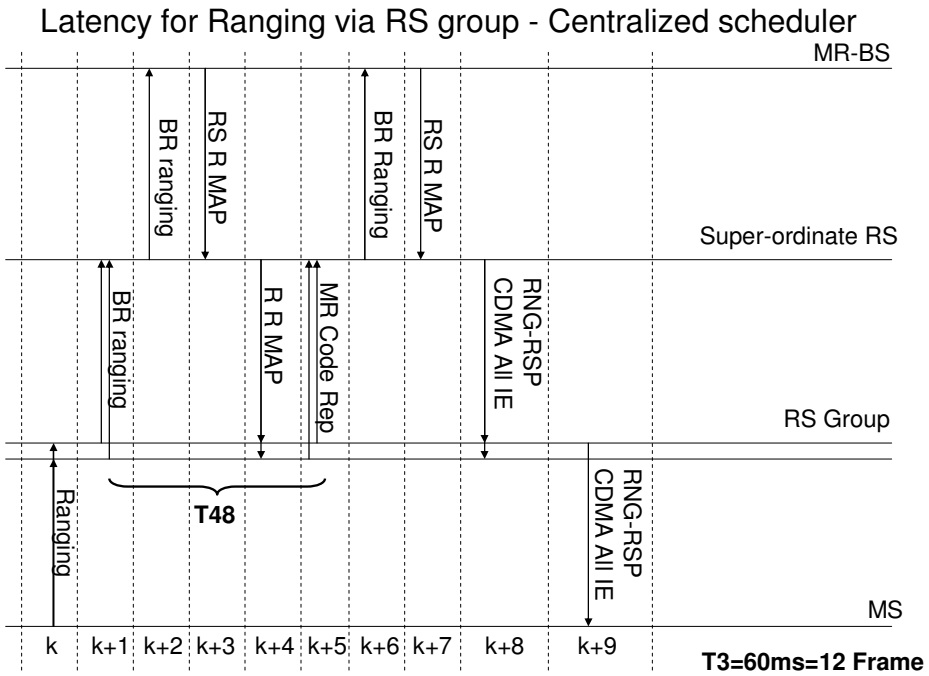

Figure 1 The super-ordinate RS of the group is required to request bandwidth to relay MAC messages between the MR-BS and RS.

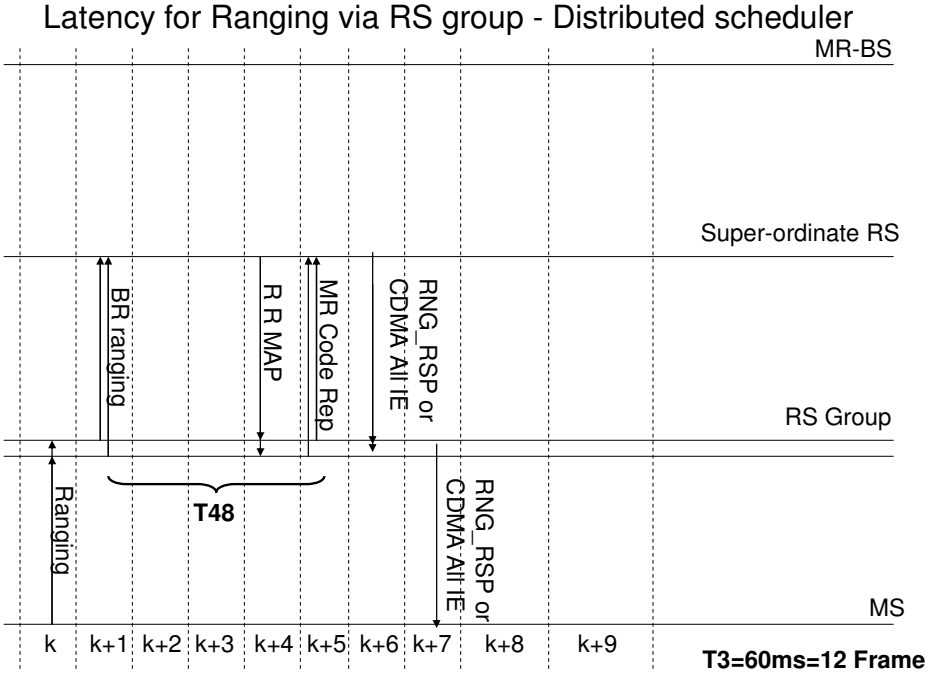

Figure 2 The system with distributed scheduler has lower latency and less overhead at the relay link between the MR-BS and distributed mode RS.

Proposed Text Changes

++++Begin Text Changes++++++++

[Modify 6.3.10.3.1.1 as follows]

6.3.10.3.1.1 MR-BS and RS behavior during contention-based initial ranging

[Insert the following text after line 18, page 108, as indicated:]

When an SS performs initial ranging in systems with transparent RSs attached to superordinate station as non-transparent RS with unique BSID operated in distributed scheduling mode, or when an SS performs initial ranging in systems with non-transparent RSs using shared BSIDs with other access stations, then superordinate station (MR-BS or non-transparent RS in centralized scheduling mode), and those non-transparent RSs with shared BSIDs shall perform the same steps as transparent RSs with the following modifications:

- The non-transparent RS operated in distributed scheduling mode shall perform adjustments directly with the SS with no interaction with the MR-BS. Instead of forwarding a MR_Code REP to the MR-BS, the RS may decide on the most appropriate path and/or adjustments.
- When the non-transparent RS operated in distributed scheduling mode receives a ranging code successfully, the communication between the RS and the MR-BS shall follow the procedures defined in this section for initial ranging in systems using non-transparent RSs with unique BSIDs and RSs operating in distributed scheduling mode, with the exception that, if the MAC messages are relayed between the distributed mode RS and the MS/SS, this RS shall provide bandwidth allocations for relaying the MAC messages between itself and the MSs/SS.

[Change the last row table in Subclause 11.7.8.10 as indicated]

Type	Length	Value	Scope
49	3	~~Bit #17-#23: Reserved~~ Bit #17: RS has distributed scheduling support and can function as a supeordinate station of the RS group Bit #18-#23: Reserved	REG-REQ REG-RSP

++++End Text Changes++++++++