Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	Simplified Scanning Procedure
Date Submitted	**2004-07-07**
Source(s)	Hang Zhang, Mo-Han Fong, Peiying Zhu, Wen Tong Nortel Networks 3500 Carling Avenue, Ottawa Ontario, Canada K2H 8E9	mhfong@nortelnetworks.com Voice: +1-613-765-8983 Fax: +1-613-765-6717
Re:	IEEE P802.16e/D3-2004
Abstract	In this contribution, a mechanism to simplify scanning procedure is proposed. This is revision 1 of the contribution. The additional texts are highlighted in 'green'. Deleted texts are crossed-out.
Purpose	Review and Adopt the suggested changes into P802.16e/D3
Notice	This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) 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 and Procedures	The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <mailto:chair@wirelessman.org> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/notices>.

1   Introduction

In the IEEE802.16e/D3 text, a MSS initiated HO includes following steps:

- The MSS monitors MOB_NBR_ADV message

- The MSS may scan neighbor BSs

- Serving BS informs those potential target BSs indicated in MOB_MSSHO_REQ message by using HO-pre-notification

- The BSs who received a HO-pre-notification request shall reply HO-pre-notification response, which shall include ACK or NACK of a potential HO. With an ACK response, the QoS level and estimated BW are indicated.

- The serving BS may select one or more potential target BSs which acked the HO-pre-notification request and inform the MSS through MOB_BSHO_RSP message

- MSS then sends MOB_HO_IND message to start the HO to the selected target BS

The above procedure can be simplified if the serving BS can acquire information such as available radio resource and service level supportable from its neighbor BSs and broadcast this information in MOB_NBR_ADV. A MSS only need to scan those BSs which can provide the acceptable BW and QoS level. In this way, some unnecessary scanning and association can be avoided.

2   Proposed Text Change

The proposed text change is based on IEEE802.16e/D3.

6.3.2.3.50 Neighbor Advertisement (MOB-NBR-ADV) message

[…]

Table 92d – MOB-NBR-ADV Message Format

Syntax	Size	Notes
MOB-NBR-ADV_Message_Format () {		
Management Message Type = 49	8 bits	
Operator_ID	24 bits	Unique ID assigned to the operator
N_NEIGHBORS	8 bits	Neighbor BSs excluding BSs declared in SHO_Neighbor for loop
For (I = 0; i < N_NEIGHBORS;i++) {		
Neighbor BS-ID	48 bits	
DL Physical Frequency	32 bits	
Configuration Change Count	8 bits	Incremented each time the information for the associated neighbor BS has changed
~~Available radio resource~~	~~8 bits~~	~~Percentage of available subchannels and symbols resource per frame~~ ~~0000: 0%~~ ~~0001: 20%~~ ~~0010: 40%~~ ~~0011: 60%~~ ~~0100: 80%~~ ~~0101: 100%~~ ~~0110-1111: reserved~~

Service level supported	4 bits	Bitmap to indicate if a particular service can be supported: bit 0: Unsolicited Grant Service (UGS) bit 1: Real-time Polling Service (rtPS) bit 2: Non-real-time Polling service (nrtPS) bit 3: Best Effort A '1' indicates support. A '0' indicates not support
TLV Encoded Neighbor information	variable	TLV specific
}		
HMAC Tuple	21 bytes	
}		

[.......]

[Insert the following text to the end of Section 6.3.2.3.50]

Available Resource and Scheduling Level Supported – This is an optional TLV**.** See section 11.15.1.

[Insert new section 11.15]

11.15 MOB-NBR-ADV message encodings

11.15.1 Neighbor BS resource availability and scheduling service supported

Type	Length	Value	Scope
?	2	Bits #0–#3: Percentage of available DL subchannels and symbols resource per frame 0000: 0% 0001: 20% 0010: 40% 0011: 60% 0100: 80% 0101: 100% 0110-1110: reserved 1111: information_not_available Bits #4-#7: Percentage of available UL subchannels and symbols resource per frame 0000: 0% 0001: 20% 0010: 40% 0011: 60% 0100: 80% 0101: 100% 0110-1110: reserved 1111: information_not_available Bits #8-#11: Bitmap to indicate if a particular service can be supported on DL: bit 8: Unsolicited Grant Service (UGS) bit 9: Real-time Polling Service (rtPS) bit 10: Non-real-time Polling service (nrtPS)	MOB-NGR-ADV

| | | bit 11: Best Effort

A '1' indicates support. A '0' indicates not support

Bits #12-#15:
Bitmap to indicate if a particular service can be supported on UL:
bit 12: Unsolicited Grant Service (UGS)
bit 13: Real-time Polling Service (rtPS)
bit 14: Non-real-time Polling service (nrtPS)
bit 15: Best Effort

A '1' indicates support. A '0' indicates not support | |