Project	IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>
Title	QoS Control Scheme for data forwarding in 802.16j
Date Submitted	2007-05-10

Source(s)		
	Hang Zhang, Peiying Zhu, Mo-Han Fong, Wen Tong, David Steer, Gamini Senarath, Derek Yu, Mark Naden, G.Q. Wang	Ranga.Reddy@us.army.mil Voice: +1 732-532-0085
	Nortel 3500 Carling Avenue Ottawa, Ontario K2H 8E9	djshyy@mitre.org Voice: +1 703 983 6515
	Ranga Reddy US Army - CERDEC, USA	arnaud.tonnerre@fr.thalesgroup.com Voice: +33 1 46 13 2850
	D. J. Shyy MITRE, USA	djamal.meddour@orange-ft.com
	Arnaud Tonnerre	
	THALES COMMUNICATIONS, FRANCE	WenTong@nortel.com
	Djamal-Eddine Meddour	pyzhu@nortel.com
	FRANCE TELECOM, FRANCE	Voice: +1 613 7631315
	Jeffrey Z. Tao, Koon Hoo Teo, Jinyun Zhang	
	Mitsubishi Electric Research Lab 201 Broadway Cambridge, MA 02139 USA	{tao, tea, jzhang}@merl.com
	Toshiyuki Kuze	Voice: 617-621-{7557,7527}
	Mitsubishi Electric Corp 5-1-1 Ofuna Kamakura, Kanagawa 2478501, Japan	Fax: 617-621-7550
	Aik Chindapol Jimmy Chui Hui Zeng Siemens Corporate Research Princeton, NJ, 08540, USA	Kuze.Toshiyuki@ah.MitsubishiElectric.co.jp Voice: +81-467-41-2885
	Teck Hu Siemens Networks Boca Raton, FL 33431, USA	Fax: +81-467-41-2486 Voice: +1 609 734 3364 Fax: +1 609 734 6565 Email: aik.chindapol@siemens.com
	Yuan-Ying Hsu Telcordia Applied Research Center Taiwan Co., Taipei, Taiwan	
	Tzu-Ming Lin, Fang-Ching Ren, Chie Ming Chou, I-Kang Fu ITRI/ NCTU Taiwan 195,Sec. 4, Chung Hsing Rd. Chutung, Hsinchu, Taiwan 310, R.O.C.	
	Torsten Fahldieck Alcatel-Lucent R&I Holderaeckerstr.35, Stuttgart, Germany	Voice: +886-2-37895177#4558 Fax: +886-2-26552078 yyhsu@tarc-tw.research.telcordia.com
	Erwu Liu, Dongyao Wang, Gang Shen, Kaibin Zhang, Jimin Liu, Shan Jin Alcatel Lucent, R&I Shanghai, No.388, Ningqiao Road, Shanghai, P.R.C.	Voice: +886-3-5914616 Fax: +886-3-5820263
	Kanchei (Ken) Loa, Yi-Hsueh Tsai, Yung-Ting Lee, Chih-Chiang Hsieh, Hua-Chiang Yin, Shiann-Tsong Sheu, Frank C.D. Tsai, Youn-Tai Lee, Heng-lang Hsu	lKFu@itri.org.tw
	Institute for Information Industry (III)	Voice: +4971182132163 Fax: +4971182132453 torsten.fahldieck@alcatel-lucent.de
		Voice: 86-21-50551240-8194 Fax: 96-21-50554554 {Erwu.liu, Dongyao.Wang, Gang.A.Shen, Kaibin.Zhang, Jimin.Liu, Shan.Jin}

@alcatel-sbell.com.cn

Voice: +886-2-2739-9616
loa@iii.org.tw

Re:	Call for Technical Comments Regarding IEEE 802.16j <http://www.ieee802.org/16/relay/docs/80216j-07_013.pdf>
Abstract	Provide a method for embedding QoS control data in R-MAC Header
Purpose	To amend the text of baseline document for Section 6.3.2
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>.

QoS Control Scheme for Data Forwarding in 802.16j

1. Purpose

In this contribution, we propose utilization of source QoS control based forwarding scheme. To support this type of QoS control we suggest adoption of the following processes:

1. **Use 3 bits in the "reserved field" of the relay MAC header defined in 07/198r8 as a "priority field" to indicate the priority of the associated MPDU.**
2. **This 3-bit "priority field" is used for RS to prioritize the data traffic along the relay path between BS and access RS**
3. **This approach is applicable to distributed scheduling relay system**

2. Introduction

In 802.16-2005, to support scheduling service for various data traffic, it defined traffic priority (11.13.5, IEEE std 802.16e-2005) for each service type (except UGS service). This traffic priority (0..7) is used by scheduler to prioritize different data steams in the same class. For example, in VoIP service, there are E911 call and normal residential phone call from the same access. Based on the assigned priority, the scheduler will allow E911 stream access first in the queue. To utilize this approach in MR relay network, in where there is no track of per-flow QoS parameters at each RS, for example, tunnel and station ID data forwarding over relay link, we suggest add 3-bit priority in the relay MAC header defined in 07/198r8 to help RS to prioritize the traffic.

Let us use tunnel as an example to show how this approach works. Each access RS can create number of tunnels (e.g., one for each service type), by following normal procedure defined in baseline doc. When access RS receives the individual data flows from each MS, it will aggregate the same priority (and the same class) packets into one relay MAC PDU, and mapping the priority into 3-bit priority in the relay MAC header, and put these relay MAC PDUs into correspondent tunnel. When this relay MAC PDU is forwarded upstream along the tunnel, every intermediate RS would learn the service type from the tunnel CID, and the priority info from each relay MAC PDU header. Then the scheduler on the RS can schedule the data packets from their class and the priority. Saying, it would allow E911 packet to be forwarded in the queue first. In this way, the scheduler of RS can effectively process the required QoS by classifying, prioritizing and aggregating the data packet .

Figure 1 below provides an example of where the 3-bit "priority field" could be in the relay MAC header specified in 07/198r8.

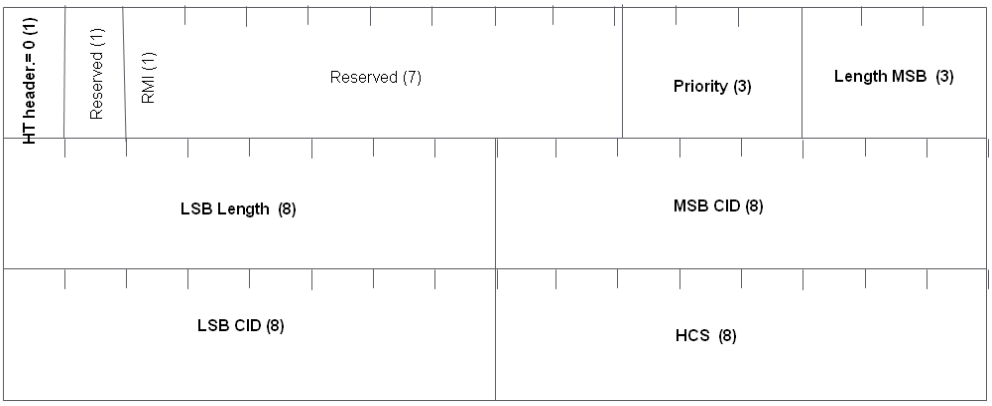

Figure 1. Relay MAC header format with proposed 3-bit "priority field"

3. Proposed Text Change

[Insert the following subclause after the end of Section 6.3.2.1]

6.3.2.1.1.1 Relay MAC PDU header format

3-bit "priority field" may be used in the relay MAC header to indicate the priority of the associated MPDU. The location of "priority field" in relay MAC header is to be determined.