Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>	
Title	**RS UL Access Zone DCH BW Request**	
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Re:	This document is in response to call for technical comments and contributions IEEE 802.16j-07/019 dated 2007-06-07.	
Abstract	This revision is the result of the harmonization of contributions 07/307r1 and 07/413. This contribution extends UL DCH request and allocation process currently in baseline for the relay zone to the access zone under centralized control. With DCH allocated in the access zone by the MR-BS, the RS can directly respond to MS BW requests using resource within the access zone DCH. With both access zone and relay zone DCH, efficient transport of both MS and RS signaling and data traffic through DCH can be achieved. The access zone DCH may also be scheduled to alleviate potential interference issue between adjacent RS/MR-BS.	
Purpose	To incorporate the proposed text into the P802.16j Baseline Document (IEEE 802.16j-06/026r4)	
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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>.	

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Introduction

The UL Dedicated Channel (DCH) request, allocation and update processes defined in the current baseline may be used for the creation and continuous operation of DCH for the relay link. The UL DCH can enable effective transport of both signaling and data traffic between RS and MR-BS in the multi-hop network with minimal signaling and delay overheads. However, under centralized control, the MS bandwidth requests in the access link are still required to be relayed all the way back to the MR-BS for centralized resource allocation. Even with DCH operating through the intermediate relay links, this round trip delay imposes an undesirable bottleneck on the performance of the services provided to the MS and additional signaling traffic on the RS to MR-BS links.

In a different situation with distributed control, there can be strong interference between adjacent RS/MR-BS when each RS performs resource scheduling independent of each other to satisfy the BW requests from its MSs.

Proposal

The delay bottleneck, under centralized control, described in the introduction can be addressed by extending the UL DCH request, allocation and update processes in the relay zone to the access zone. With DCH allocated in the access zone by the MR-BS, the RS can directly respond to MS bandwidth requests using resources within the access zone DCH. This completes the UL dedicated pipe end-to-end from the MS to the MR-BS and enables efficient transport of both MS and RS signaling and data traffic to the MR-BS. The only difference in the access zone DCH request process is that the request is done in number of slots instead of bytes.

The possibility of strong inter-station interference, under distributed control of access traffic, can also be alleviated through the allocation of dedicated resource to the RS in the UL access zone. This is achieved by allocating non-overlapping resources to adjacent RS as the preferred region to serve each of their respective MSs.

Text Proposal

++++++++++++++ Start Text Proposal ++

[Change last paragraph of subclause 6.3.6.7.3.1 as indicated]

6.3.6.7.3.1 Dedicated channel between MR-BS and RS

An RS may estimate the average data rate of its relayed uplink connections and request to be allocated a rate

based dedicated channel (RS UL_DCH with ~~DCH~~Request TYPE 10). Bandwidth requests from SSs may be filtered by the RS to reduce the number of bandwidth requests transmitted on the relay links.

[Add the following subclause]

6.3.6.7.4 Dedicated resource in access zone

Under centralized control, the MR-BS may allocate dedicated resource in the UL access zone to the RS without an explicit request from the RS. The allocation is done using RS_UL_DCH assignment IE (see 8.4.5.9.2) with an indication of an access zone assignment. The RS can independently schedule resource within the access zone DCH to directly respond to MS bandwidth requests. If the MR-BS does not allocate dedicated resource in the UL access zone to an RS, the RS may request an allocation using RS UL_DCH request header (see 6.3.2.1.2.2.2.2).

Under distributed control, dedicated resource in the UL access zone may also be assigned to the access RS using the RS_UL_DCH assignment IE and an access RS may request dedicated resource allocation using RS UL_DCH request header.

The MR-BS can terminate or decrease the bandwidth and/or the allocation interval of the access zone dedicated resource without request from an RS.

[Change Figure 35c in subclause 6.3.2.1.2.2.2.2 on page 11 as indicated]

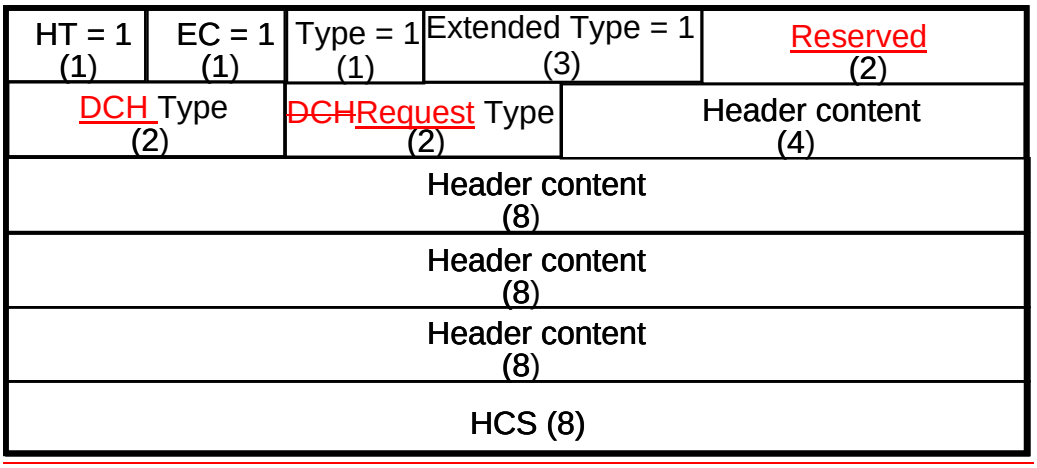

Figure 35c – RS UL_DCH request header

[Change Table 19c in subclause 6.3.2.1.2.2.2.2 on page 11 as indicated]

Figure 19c – RS UL_DCH request header

Syntax	Size	Notes
MAC Header() {		
HT	1 bit	Shall be set to 1
EC	1 bit	Shall be set to 1
Type	1 bit	Shall be set to 1
Extended TYPE	3 bits	Shall be set to 001 for RS UL_DCH request header
Reserved	2 bits	

DCH TYPE	~~4 bits~~ 2 bits	~~00~~00 = ~~DCH Request~~ Relay zone 01 = Access zone ~~0001~~10 - ~~11~~11 = *Reserved*
if(DCH TYPE == ~~00~~00) ~~||~~ (DCH TYPE == 01){		~~DCH Request~~
~~DCH~~Request TYPE	2 bits	00 = DCH Request Incremental 01 = DCH Request Aggregate 10 = DCH Request Rate Based 11 = Reserved
if(~~DCH~~Request TYPE == 00){		DCH Request Incremental
Bandwidth request	16 bits	~~Number of bytes requested by the RS.~~ Relay zone request in number of bytes. Access zone request in number of slots. Zero in this field indicates DCH release request.
N	4 ~~bits~~bits	Allocation repeats once every N frames
}elseif (~~DCH~~Request TYPE == 01){		DCH Request Aggregate
Bandwidth request	16 bits	~~Number of bytes requested by the RS.~~ Relay zone request in number of bytes. Access zone request in number of slots. Zero in this field indicates DCH release request.
N	4 bits	Allocation repeats once every N frames
}elseif (~~DCH~~Request TYPE == 10){		DCH Request Rate Based (only for relay zone request)

[Change subclause 8.4.5.9.2 and Table 496dc on page 162 as indicated]

8.4.5.9.2 RS UL DCH assignment IE

This IE is used for the initial allocation and subsequent updates of the uplink dedicated channel ~~on the R-link~~.

Table 496d—RS_UL_DCH assignment IE format

Syntax	Size	Notes
RS_UL_DCH assignment IE {		
Type	5 bits	
Length	4 bits	
RSCID	8 bits	Reduced basic CID of the RS
Update type	2 bits	00 = Normal 01 = Service flow based 10 = Access zone ~~10 to~~ 11 = Reserved
If (Update type == 01) {		**If service flow based update**
Throughput size	24 bits	Amount of throughput update in byte/s
Access RSCID	8 bits	Reduced basic CID of the access RS of the MS that completed the service flow event
}		
Assignment type	2 bits	00 = Incremental (Add the specified resource to UL DCH) 01 = ~~Aggregate~~ Removal (Remove the specified resource from UL DCH) 10 = ~~Remove~~ Aggregate (An aggregate assignment with no resource means UL DCH removal) 11 = ~~Remove all~~ Reserved

++++++++++++++++ End Text Proposal ++