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Title	**Service flow management for RS**
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Re:	This contribution is response to call for technical proposal (IEEE 802.16j-06/027).
Abstract	This document proposes service flow management sequence through RS.
Purpose	Discuss and adapt proposed text and message format.
Notice	
Release	
Patent Policy and Procedures	

Service flow management for RS

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1. General

This document presents an amendment for service flow management of RS.

2. Background

In centralized scheduling case, BS manages all subordinate nodes. However, in distributed scheduling case, BS does not need to manage all nodes, and RS may be able to manage its subordinate node by itself.

We propose the service flow management sequence through RS for centralized/distributed scheduling case.

3. Text to be inserted into standard

6.3.14.9.3 DSA
6.3.14.9.3.1 SS-initiated DSA
Insert the following table the end of 6.3.14.9.3.1:

In MMR centralized scheduling case, a RS only forwards each DSA messages from SS to BS and vice versa. The BS checks whether the QoS requirements can be supported both on relay link (BS-RS) and on access link (RS-MS). This process is illustrated in Table 125a.

Table 125a – DSA initiated from SS through RS (Centralized scheduling case)

SS		RS		BS
New service flow needed				
Check if resource are available				
Send DSA-REQ	--DSA-REQ-->	Receive / Send DSA-REQ	--DSA-REQ-->	Receive DSA-REQ
Set Timers T7 and T14				
Timer T14 Stops	<--DSX-RVD--	Receive / Send DSX-RVD	<--DSX-RVD--	DSA-REQ integrity valid
				Check whether SS is authorized for Service
				Check whether service flow QoS can be supported both on relay link and on access link
				Create SFID
				If uplink AdmittedQoSParamSet is non-null, map service flow to CID
				If uplink ActiveQoSParamSet is non-null, Enable reception of data on new uplink service flow
Receive DSA-RSP	<--DSA-RSP--	Receive / Send DSA-RSP	<--DSA-RSP--	Send DSA-RSP
Timer T7 Stops				
If ActiveQoSParamSet is non-null, Enable transmission and/or reception of data on new service flow				
Send DSA-ACK	--DSA-ACK-->	Receive / Send DSA-ACK	--DSA-ACK-->	Receive DSA-ACK
				If downlink ActiveQoSParamSet is non-null, Enable transmission of data on new downlink service flow

[a] Authorization happens prior to the DSA-REQ being received by the BS. The details of BS signaling to anticipate a DSA-REQ are beyond the scope of this standard.

In MMR distributed scheduling case, RS shall check whether the QoS requirements can be supported on access link (RS-SS) and, if it can be supported, transfers a DSA-REQ message to the BS. If not so, RS shall reply a DSX-RVD in order to inform the QoS can be not supported.

The BS checks whether the QoS requirements can be supported on relay link (BS-RS). This process is illustrated in Table 125b.

Table 125b – DSA initiated from SS through RS (Distributed scheduling case)

SS		RS		BS
New service flow needed				
Check if resource are available				
Send DSA-REQ	--DSA-REQ-->	Receive / Send DSA-REQ		
Set Timers T7 and T14		Check whether service flow QoS can be supported on access link (RS~SS)		
		If the QoS can not be supported, reply DSX-RVD (CC=reject) to SS		
Receive DSX-RVD (CC=reject)	<--DSX-RVD--	Send DSX-RVD (CC=reject)		
			--DSA-REQ-->	Receive DSA-REQ
Timer T14 Stops	<--DSX-RVD--	Receive / Send DSX-RVD	<--DSX-RVD--	DSA-REQ integrity valid
				Check whether SS is authorized for Service
				Check whether service flow QoS can be supported on relay link (BS~RS)
				Create SFID
				If uplink AdmittedQoSParamSet is non-null, map service flow to CID
				If uplink ActiveQoSParamSet is non-null, Enable reception of data on new uplink service flow
Receive DSA-RSP	<--DSA-RSP--	Receive / Send DSA-RSP	<--DSA-RSP--	Send DSA-RSP
Timer T7 Stops				
If ActiveQoSParamSet is non-null, Enable transmission and/or reception of data on new service flow				
Send DSA-ACK	--DSA-ACK-->	Receive / Send DSA-ACK	--DSA-ACK-->	Receive DSA-ACK
		Update service flow on access link (RS~SS)		If downlink ActiveQoSParamSet is non-null, Enable transmission of data on new downlink service flow

[a] Authorization happens prior to the DSA-REQ being received by the BS. The details of BS signaling to anticipate a DSA-REQ are beyond the scope of this standard.

6.3.14.9.3.2 BS-initiated DSA

Insert the following table the end of 6.3.14.9.3.2:

In MMR centralized scheduling case, a RS only forwards each DSA messages from BS to SS and vice versa. The BS checks whether the QoS requirements can be supported both on relay link (BS-RS) and on access link (RS-MS). This process is illustrated in Table 126a.

Table 126a – DSA initiated from BS through RS (Centralized scheduling case)

SS		RS		BS
				New service flow required for SS Check whether SS is authorized for Service Check whether service flow(s) QoS can be supported both on relay link and on access link Create SFID If AdmittedQoSParamSet is non-null, map service flow to CID
Receive DSA-REQ	<--DSA-REQ--	Receive / Send DSA-REQ	<--DSA-REQ--	Send DSA-REQ Set Timer T7
Confirm that SS can support service flow Add Downlink SFID (if present) Enable reception on any new downlink service flow				
Send DSA-RSP	--DSA-RSP-->	Receive / Send DSA-RSP	--DSA-RSP-->	Receive DSA-RSP Timer T7 Stops Enable transmission (downlink) or reception (uplink) of data on new service flow
Receive DSA-ACK Enable transmission on new uplink service flow	<--DSA-ACK--	Receive / Send DSA-ACK	<--DSA-ACK--	Send DSA-ACK

In MMR distributed scheduling case, the BS only checks whether the QoS requirements can be supported on relay link (BS-RS).

And then the RS shall check whether the QoS requirements can be supported on access link (RS-SS) and, if it can be supported, transfers a DSA-REQ message to the BS. If not so, RS shall reply a DSX-RVD in order to inform the QoS can be not supported. This process is illustrated in Table 126b.

Table 126b – DSA initiated from BS through RS (Distributed scheduling case)

SS		RS		BS
				New service flow required for SS
				Check whether SS is authorized for Service
				Check whether service flow(s) QoS can be supported on relay link (BS~RS)
				Create SFID
				If AdmittedQoSParamSet is non-null, map service flow to CID
		Receive / Send DSA-REQ	<--DSA-REQ--	Send DSA-REQ
		Check whether service flow(s) QoS can be supported on access link (RS~SS)		Set Timer T7
		If the QoS can not be supported, reply DSA-RSP (CC=reject) to BS		
		Send DSA-RSP (CC=reject)	--DSA-RSP-->	Receive DSA-RSP (CC=reject)
Receive DSA-REQ	<--DSA-REQ--			
Confirm that SS can support service flow				
Add Downlink SFID (if present)				
Enable reception on any new downlink service flow				
Send DSA-RSP	--DSA-RSP-->	Receive / Send DSA-RSP	--DSA-RSP-->	Receive DSA-RSP
				Timer T7 Stops
				Enable transmission (downlink) or reception (uplink) of data on new service flow
Receive DSA-ACK	<--DSA-ACK--	Receive / Send DSA-ACK	<--DSA-ACK--	Send DSA-ACK
Enable transmission on new uplink service flow		Update service flow on access link (RS~SS)		

6.3.14.9.4 DSC

6.3.14.9.4.1 SS-initiated DSC

Insert the following table the end of 6.3.14.9.4.1:

In MMR centralized scheduling case, a RS only forwards each DSC messages from SS to BS and vice versa. The BS checks whether the modified requirements can be supported both on relay link (BS-RS) and on access link (RS-MS). This process is illustrated in Table 127a.

Table 127a – SS-initiated DSC through RS (Centralized scheduling case)

BS		RS		SS
				Service flow requires modifying
Receive DSC-REQ	<--DSC-REQ--	Receive / Send DSC-REQ	<--DSC-REQ--	Send DSC-REQ Set Timers T7 and T14
DSC-REQ integrity valid	--DSX-RVD-->	Receive / Send DSX-RVD	--DSX-RVD-->	Timer T14 Stops
Validate Request both on relay link and on access link				
Modify service flow				
Increase Channel Bandwidth if Required				
Send DSC-RSP	--DSC-RSP-->	Receive / Send DSC-RSP	--DSC-RSP-->	Receive DSC-RSP Timer T7 Stops
				Modify service flow

				Adjust Payload Bandwidth
Receive DSC-ACK	<--DSC-ACK--	Receive / Send DSC-ACK	<--DSC-ACK--	Send DSC-ACK
Decease Channel Bandwidth if Required				

In MMR distributed scheduling case, RS shall check whether the modified requirements can be supported on access link (RS-SS) and, if it can be supported, transfers a DSC-REQ message to the BS. If not so, RS shall reply a DSX-RVD in order to inform the requirements can be not supported.

The BS checks whether the modified requirements can be supported on relay link (BS-RS). This process is illustrated in Table 127b.

Table 127b – SS-initiated DSC through RS (Distributed scheduling case)

BS		RS		SS
				Service flow requires modifying
		Receive / Send DSC-REQ	<--DSC-REQ--	Send DSC-REQ Set Timers T7 and T14
		Check whether required service flow QoS can be supported on access link (RS~SS)		
		If the QoS can not be supported, reply DSX-RVD (CC=reject) to SS		
		Send DSX-RVD (CC=reject)	--DSX-RVD-->	Receive DSX-RVD (CC=reject)
Receive DSC-REQ	<--DSC-REQ--			
DSC-REQ integrity valid	--DSX-RVD-->	Receive / Send DSX-RVD	--DSX-RVD-->	Timer T14 Stops
Validate Request on relay link (BS~RS)				
Modify service flow				
Increase Channel Bandwidth if Required				
Send DSC-RSP	--DSC-RSP-->	Receive / Send DSC-RSP	--DSC-RSP-->	Receive DSC-RSP Timer T7 Stops
				Modify service flow
				Adjust Payload Bandwidth
Receive DSC-ACK	<--DSC-ACK--	Receive / Send DSC-ACK	<--DSC-ACK--	Send DSC-ACK
Decease Channel Bandwidth if Required		Update service flow on access link (RS~SS)		

6.3.14.9.4.2 BS-initiated DSC

Insert the following table the end of 6.3.14.9.4.2:

In MMR centralized scheduling case, a RS only forwards each DSC messages from BS to SS and vice versa. The BS checks whether the modified requirements can be supported both on relay link (BS-RS) and on access link (RS-MS). This process is illustrated in Table 128a.

Table 128a – BS-initiated DSC through RS (Centralized scheduling case)

BS		RS		SS
Service flow requires modifying				
Validate the modifying both on relay link and on access link				
Send DSC-REQ Set Timers T7	--DSC-REQ-->	Receive / Send DSC-REQ	--DSC-REQ-->	Receive DSC-REQ
				Validate Request
				Modify service flow
				Decrease Payload Bandwidth if Required
Receive DSC-RSP	<--DSC-RSP--	Receive / Send DSC-RSP	<--DSC-RSP--	Send DSC-RSP

Timer T7 Stops				
Modify service flow				
Adjust Payload Bandwidth				
Send DSC-ACK	--DSC-ACK-->	Receive / Send DSC-ACK	--DSC-ACK-->	Receive DSC-ACK
				Increase Payload Bandwidth if Required

In MMR distributed scheduling case, the BS only checks whether the modified requirements can be supported on relay link (BS-RS).

And then the RS shall check whether the modified requirements can be supported on access link (RS-SS) and, if it can be supported, transfers a DSC-REQ message to the SS. If not so, RS shall reply a DSX-RVD in order to inform the requirements can be not supported. This process is illustrated in Table 128b.

Table 128b – BS-initiated DSC through RS (Distributed scheduling case)

BS		RS		SS
Service flow requires modifying				
Validate the modifying on relay link (BS~RS)				
Send DSC-REQ Set Timers T7	--DSC-REQ-->	Receive / Send DSC-REQ		
		Check whether required service flow QoS can be supported on access link (RS~SS)		
		If the QoS can not be supported, reply DSC-RSP (CC=reject) to BS		
Receive DSA-RSP (CC=reject)	<--DSC-RSP--	Send DSA-RSP (CC=reject)		
			--DSC-REQ-->	Receive DSC-REQ
				Validate Request
				Modify service flow
				Decrease Payload Bandwidth if Required
Receive DSC-RSP Timer T7 Stops	<--DSC-RSP--	Receive / Send DSC-RSP	<--DSC-RSP--	Send DSC-RSP
Modify service flow				
Adjust Payload Bandwidth				
Send DSC-ACK	--DSC-ACK-->	Receive / Send DSC-ACK	--DSC-ACK-->	Receive DSC-ACK
		Update service flow on access link (RS~SS)		Increase Payload Bandwidth if Required

6.3.14.9.5 Connection release

6.3.14.9.5.1 SS-initiated DSD

Insert the following table the end of 6.3.14.9.5.1:

In MMR centralized scheduling case, the BS shall delete the service flow both on relay link (BS-RS) and on access link (RS-SS). This process is illustrated in Table 129b.

Table 129a – DSD-initiated from SS through RS (Centralized scheduling case)

SS		RS		BS
Service flow no longer needed				
Delete service flow				
Send DSD-REQ	--DSD-REQ-->	Receive / Send DSD-REQ	--DSD-REQ-->	Receive DSD-REQ
				Verify SS is service flow “owner”

				Delete service flow both on relay link and on access link
Receive DSD-RSP	<--DSD-RSP--	Receive / Send DSD-RSP	<--DSD-RSP--	Send DSD-RSP

In MMR distributed scheduling case, the BS shall delete the service flow on relay link (BS-RS). And then the RS shall delete the service flow on access link (RS-SS). This process is illustrated in Table 128b.

Table 129b – DSD-initiated from SS through RS (Distributed scheduling case)

SS		RS		BS
Service flow no longer needed				
Delete service flow				
Send DSD-REQ	--DSD-REQ-->	Receive / Send DSD-REQ	--DSD-REQ-->	Receive DSD-REQ
				Verify SS is service flow "owner"
				Delete service flow on relay link (BS~RS)
Receive DSD-RSP	<--DSD-RSP--	Receive / Send DSD-RSP	<--DSD-RSP--	Send DSD-RSP
		Delete service flow on access link (RS~SS)		

6.3.14.9.5.2 BS-initiated DSD

Insert the following table the end of 6.3.14.9.5.2:

In MMR centralized scheduling case, the BS shall delete the service flow both on relay link (BS-RS) and on access link (RS-SS). This process is illustrated in Table 130b.

Table 130a – DSD-initiated from BS through RS (Centralized scheduling case)

SS		RS		BS
				Service flow no longer needed
				Delete service flow both on relay link and on access link
				Determine associated SS for this service flow
Receive DSD-REQ	<--DSD-REQ--	Receive / Send DSD-REQ	<--DSD-REQ--	Send DSD-REQ
Delete service flow				
Send DSD-RSP	--DSD-RSP-->	Receive / Send DSD-RSP	--DSD-RSP-->	Receive DSD-RSP

In MMR distributed scheduling case, the BS shall delete the service flow on relay link (BS-RS). And then the RS shall delete the service flow on access link (RS-SS). This process is illustrated in Table 130b.

Table 130b – DSD-initiated from BS through RS (Distributed scheduling case)

SS		RS		BS
				Service flow no longer needed
				Delete service flow on relay link (BS~RS)
				Determine associated SS for this service flow
Receive DSD-REQ	<--DSD-REQ--	Receive / Send DSD-REQ	<--DSD-REQ--	Send DSD-REQ
Delete service flow				
Send DSD-RSP	--DSD-RSP-->	Receive / Send DSD-RSP	--DSD-RSP-->	Receive DSD-RSP
		Delete service flow on access link (RS~SS)		