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Re:	Letter Ballot 26b	
Abstract	The resource allocation scheme of 802.16e is extended to enable persistent allocations (also referred to as periodic allocations).	
Purpose	Accept the proposed specification changes on IEEE P802.16Rev2/D3.	
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Reallocation Scheme in Persistent Allocation

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1. Introduction

Persistent allocation scheme is a relevant solution to increase VoIP capacity. It can significantly reduce the periodic MAP overhead since allocation IE only appears once with the fixed resource position and fixed transmission format during an available time. Many contributions to persistent allocation were issued in last meeting and have been treated in the way of harmonization by Rapporteur Group [PA]. However, in case of reallocation by AMC or/and change of buffer status, the MAP IE format relative to the reallocation in persistent allocation still has redundancies. This contribution proposes the modified MAP IE format which can eliminate these redundancies.

Through the harmonization process, the MAP NACK channel has been defined as a shared physical channel which indicates MAP decoding errors from MSs involved with the corresponding persistent allocation. Upon receiving a MAP NACK indication, a BS shall resent an updated persistent allocation IE just in case that the persistent allocation is changed from the previous frame. With implicit indication of no change, the MS shall resume using the previous persistent resource allocation. When MAP NACK channel errors occur in the BS, there is still a possibility of collision on uplink persistent region. Hence, this contribution also considers the MAP IE format to solve the collision problem in uplink sub-frame.

2. Proposed Solution

MAP Ovrehead Reduction

In order to relinquish the allocated radio resources during voice inactive interval, many allocations and de-allocations will take place in VoIP service using persistent allocation scheme. Also, the changes of MCS for link adaptation owing to channel variations need the reassignment of persistent allocation.

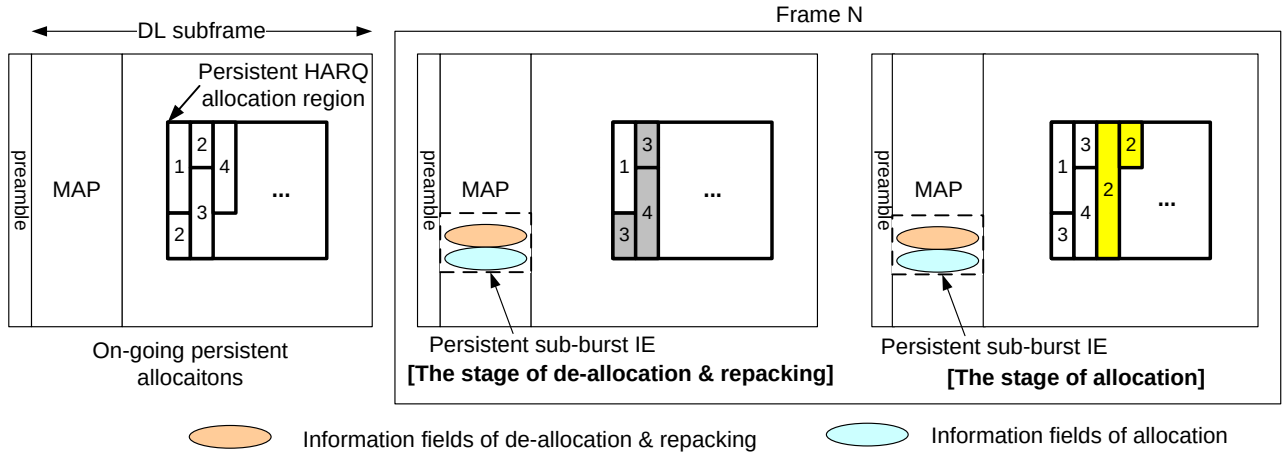

Figure 1. De-allocation/allocation for the extension of MS-2's persistent resource

As one solution to AMC in persistent allocation scheme, we may consider that new persistent allocation will be made according to the updated MCS after the existing persistent resource is released. Figure 1 and Figure 2 show the examples of resource re-assignment in persistent allocation. As shown in Figure 1, in case that the MS-2 requires more slots because of poor channel condition, the MAP should include not only information fields of de-allocation/repacking but also information fields of allocation which appear in a persistent sub-burst IE.

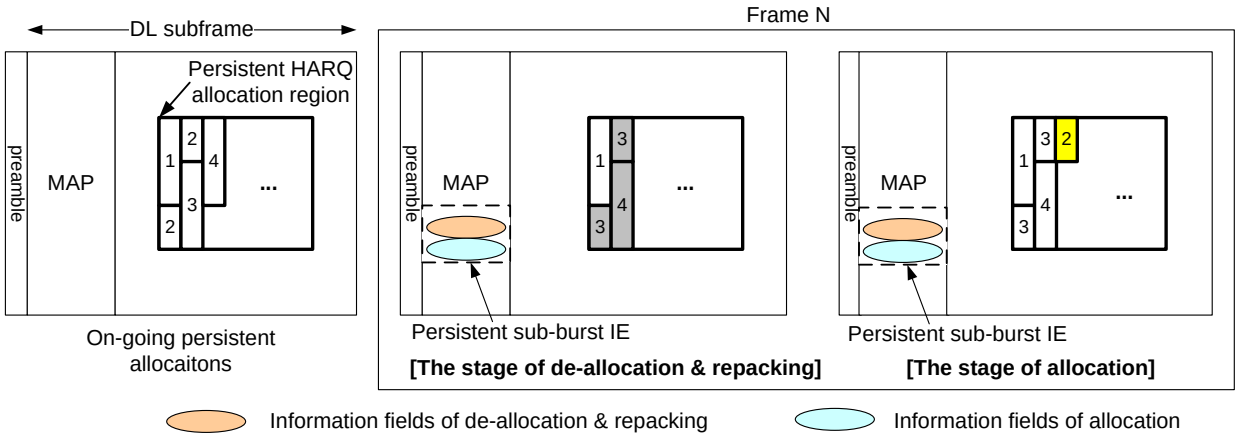

Figure 2. De-allocation/allocation for the shrink of MS-2's persistent resource

Figure 2 shows the case that some slots allocated to MS-2 is reduced in persistent allocation. Like the preceding example in Figure 1, the fields for both de-allocation/repacking and allocation are needed. These two separate repacking and re-allocation will generate some overheads which can be, however, minimized with careful consideration that both processes and closely coupled.

This contribution proposes a modified persistent sub-burst IE which can perform both reallocation and repacking using one bundle of information fields. Figure 3 shows the re-arrangement of persistent allocation using the proposed IE format.

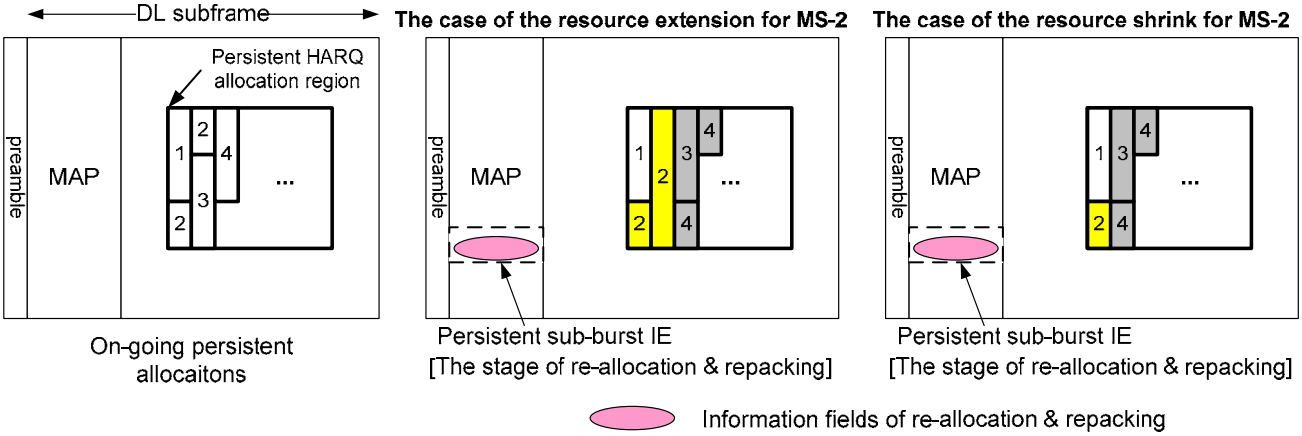

Figure 3. Reallocation for MS-2's persistent resource

The proposed IE formats are shown on the session of proposed text in detail. "Delta Duration" field in modified persistent sub-burst IE provides information about reallocation and repacking. In case that RCID of MS is equal to RCID value in the IE relative to the bundle of information fields, the corresponding MS should

update its own allocation information using “Delta Duration” field. Otherwise, this field should be also interpreted as repacking by other MSs.

Moreover, 1 MSB of “Delta Duration” field indicates the direction of resource rearrangement. When it is set to 1, the reallocated slots could be increased such as the case of the resource extension of MS-2 in Figure 3. Here, we note that slot offset for repacking should be the sum of the difference of duration (other LSBs of “Delta Duration” field) and its own slot offset, ensuring that the repacked and reallocated region do not cause some collisions with the involved MSs. Otherwise, in case that it is set to 0, reallocated slots could be decreased and the direction of repacking is equal the same as the direction of repacking in de-allocation case.

Accordingly, the proposed persistent sub-burst IE can effectually reduce MAP overhead while the existing persistent scheme is still working in MSs.

Collision Avoidance of Persistent Allocation in UL Sub-frame

According to MAP error detection scheme using MAP NACK channel, a MS will transmit a MAP NACK signal through the Fast Feedback channel region when that it does not successfully receive the MAP in a Persistent allocation frame. However, there can be some ambiguity in persistent allocation in case that the BS fails to receive the MAP NACK signal at frame N and the MS which transmitted MAP NACK signal relevant to the frame N successfully receive the MAP at frame N+Allocation Period. When the MS decodes the MAP without any change in UL persistent allocation at frame N+Allocation Period, the MS resumes its own persistent allocation. However, MS’s burst transmission on the UL persistent allocation can cause a sequential collision with other transmission if the MAP at frame N included some changes. Hence, we focus on the case of UL persistent allocation by reason of possibility that sequential collisions may occur in such a circumstance.

We consider an approach of change counter in order to keep away from the collision problem caused by MAP NACK channel errors. As shown in Figure 4, a BS increases a PCC (Persistent Change Counter) relevant to the persistent allocation group as resource allocation arrangement is changed. It is noted that the PCC value can be increased by one in an allocation period even though the allocation IE includes many reallocations and/or rearrangements. A MS involved in uplink persistent allocation group should store its PCC value and update it when the change of persistent allocation occurs. When decoding the MAP in the next period after MAP error detection, if MS’s own PCC value is not equal to the PCC in persistent allocation IE transmitted from the BS, the MS should transmit a NACK in the shared MAP NACK channel in order to request for a retransmission of the updated persistent allocation IE. The MS shall not transmit any persistently allocated burst until it successfully receives the updated persistent allocation IE.

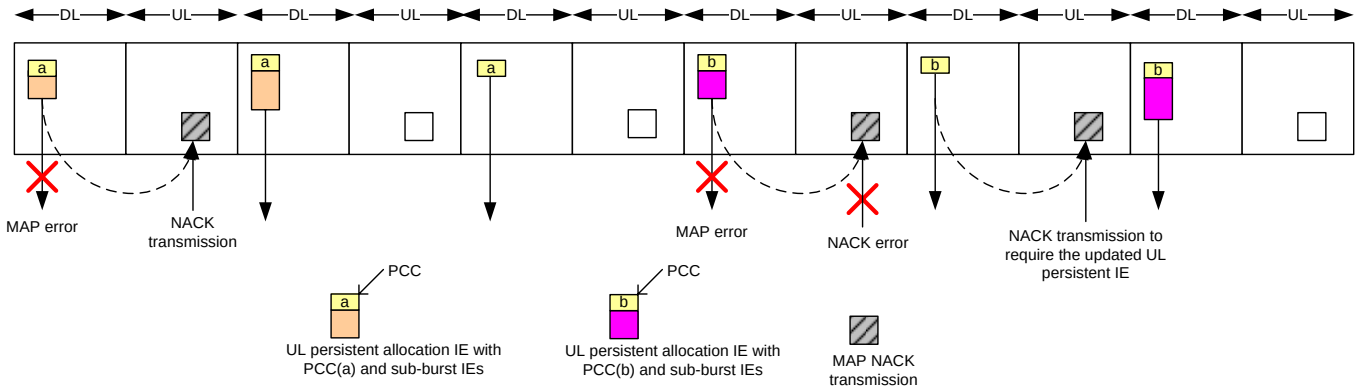

Figure 4. Persistent Chang Counter in UL sub-frame.

3. Proposed Text

[Add new section to 8.4.5.3.28]

8.4.5.3.28 HARQ DL MAP Persistent Allocation IE

Table XXX: Persistent HARQ DL MAP allocation IE

Syntax	Size (bits)	Notes
Persistent HARQ DL MAP IE () {	--	--
Extended-2 DIUC	4	Persistent HARQ DL MAP IE = TBD
Length	8	Length in bytes
RCID Type	2	0b00: Normal CID 0b01: RCID11 0b10: RCID7 0b11: RCID3
While (data remaining) {	--	--
Region ID use indicator	1	0: Region ID not used 1: Region ID used
if (Region ID use indicator ==0) {		
OFDMA Symbol offset	8	Offset from the start of DL sub-frame
Subchannel offset	7	
Number of OFDMA symbols	7	
Number of subchannels	7	
Rectangular sub-burst indication	1	Indicates sub-burst allocations are time-first rectangular. The duration field in each sub-burst IE specifies the number of subchannels for each rectangular allocation. This is only valid for AMC allocations and all allocations with dedicated pilots. When this field is clear, sub-bursts shall be allocated in frequency-first manner and the duration field reverts to the default operation
} else {	--	--
Region ID	8	Index to the DL region defined in DL region definition TLV in DCD
}	--	--
Mode	4	Indicates the mode in this HARQ region 0b0000: Persistent Chase HARQ 0b0001: Persistent Incremental redundancy HARQ for CTC 0b0010: Persistent Incremental redundancy HARQ for Convolutional Code 0b0011: Persistent MIMO Chase HARQ 0b0100: Persistent MIMO IR HARQ 0b0101: Persistent MIMO IR HARQ for Convolutional Code 0b0110: Persistent MIMO STC HARQ 0b0111 to 0b1111 : reserved
Subburst IE Length	8	Length, in nibbles, to indicate the size of the subburst IE in this HARQ mode. The MS may skip DL HARQ Subburst IE if it does not support the HARQ mode. However, the MS shall decode NACK Channel field from each DL HARQ Subburst IE to determine the UL

		ACK channel it shall use for its DL HARQ burst.
if (Mode == 0b0000) {	--	--
Persistent Chase HARQ sub-burst IE	*variable*	--
} else if (Mode == 0b0001) {		
Persistent Incremental redundancy HARQ for CTC sub-burst IE	*variable*	--
} else if (Mode == 0b0010) {	--	--
Persistent Incremental redundancy HARQ for Convolutional Code	*variable*	--
} else if (Mode == 0b0011) {	--	--
Persistent MIMO Chase HARQ	*variable*	--
} else if (Mode == 0b0100) {		
Persistent MIMO IR HARQ	*variable*	--
} else if (Mode == 0b0101) {	--	--
Persistent MIMO IR HARQ for Convolutional Code	*variable*	--
} else if (Mode == 0b0110) {		
Persistent MIMO STC HARQ	*variable*	
}		
}		
Padding	*variable*	Padding to bytes boundary; padding value shall be set to zero.
}		

Table YYY - Persistent DL HARQ Chase Subburst IE format

Syntax	Size (bits)	Notes
Persistent_DL_HARQ_Chase_Sub-Burst_IE() {		
N sub burst	4	Number of sub-bursts in the 2D rectangular region is this field value plus 1
For (j=1;j<Number of sub bursts; j++) {		
Allocation Flag	1	1 = allocate 0 = de-allocate
RCID_IE()	variable	
If (Allocation Flag == 0) {		
Repacking Flag	1	0 = no repacking 1 = repacking
if (Repacking Flag ==1) {		
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame

		10 bits – 20 ms frame
}		
}		
If (Allocation Flag == 1) {		
Persistent Flag	1	0 = non-persistent 1 = persistent
Repacking Flag	1	0 = no repacking 1 = repacking Note: The case of non-persistent should not be repacked.
If (Repacking Flag == 0) {		
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
If (Persistent Flag == 1) {		
Allocation Period (ap)	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
}		
Boosting	3	0b000: Normal (not boosted) 0b001: +6dB 0b010: –6dB 0b011: +9dB 0b100: +3dB 0b101: –3dB 0b110: –9dB 0b111: –12dB; Note that if the Persistent flag is set, the boosting value applies to the first allocation instance only; [Mo-Han please elaborate as to what you would like say here…]
Sub-burst DIUC indicator	1	If Sub-Burst DIUC Indicator is 1, it indicates that DIUC is explicitly assigned for this subburst. Otherwise, this subburst will use the same DIUC as the previous subburst. If j is 0 then this indicator shall be 1.
If (Sub-burst DIUC indicator ==1) {		
DIUC	4	-
Repetition coding indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
ACID	4	-
AI_SN	1	Initial AI_SN for each ACID
ACK disable	1	When ACK Disable == 1, the allocated subburst does not

		require an ACK to be transmitted by the SS in the ACKCH Region (see 8.4.5.4.25). In this case, no ACK channel is allocated for the subburst in the ACKCH Region. For the burst, BS shall not perform HARQ retransmission and MS shall ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.
If (ACK disable== 0) {		
ACK channel	8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
}		
Dedicated DL control Indicator	2	LSB #0 indicates inclusion of CQI control LSB #1 indicates inclusion of Dedicated DL Control IE.
If (LSB #0 of dedicated DL control indicator ==1){		-
Duration (d)	4	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS for 2(d–1) frames. If d is 0b0000, deallocates all CQI feedback when the current ACID is completed successfully. If d is 0b1111, the MS should report until the BS command for the MS to stop.
If (Duration !=0b0000){		
Allocation index	6	Index to the channel in a frame the CQI report should be transmitted by the SS.
Period (p)	3	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS in every 2^p frames.
Frame offset	3	The MS starts reporting at the frame of which the number has the same 3 LSB as the specified frame offset. If the current frame is specified, the MS should start reporting in eight frames.
}		
}		
If (LSB #1 of dedicated DL control indicator ==1){		
Dedicated DL control IE ()	*variable*	
}		
}		
If (Repacking Flag == 1) {		
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot

		offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
Sub-burst DIUC indicator	1	If Sub-Burst DIUC Indicator is 1, it indicates that DIUC is explicitly assigned for this subburst. Otherwise, this subburst will use the same DIUC as the previous subburst. If j is 0 then this indicator shall be 1.
If (Sub-burst DIUC indicator ==1) {		
DIUC	4	-
Repetition coding indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to 0.
}		

Table YYY – Persistent DL HARQ IR CTC Subburst IE format

Syntax	Size (bits)	Notes
Persistent_DL_HARQ_IR_CTC_Sub-Burst_IE() {		
N sub burst	4	Number of sub-bursts in the 2D rectangular region is this field value plus 1
For (j=1;j<Number of sub bursts; j++) {		
RCID_IE()	*variable*	
Allocation Flag	1	0 = de-allocate 1 = allocate
If (Allocation Flag == 0) {		
Repacking Flag	1	0 = no repacking 1 = repacking
if (Repacking Flag ==1) {		
N_{EP}	4	
N_{SCH}	4	
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame

		8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (Allocation Flag == 1) {		
Persistent Flag	1	0 = non-persistent 1 = persistent
Repacking Flag	1	0 = no repacking 1 = repacking Note: The case of non-persistent should not be repacked.
If (Repacking Flag == 0) {		
N_{EP}	4	
N_{SCH}	4	
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
If (Persistent Flag == 1) {		
Allocation Period (ap)	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
}		
Boosting	3	0b000: Normal (not boosted) 0b001: +6dB 0b010: –6dB 0b011: +9dB 0b100: +3dB 0b101: –3dB 0b110: –9dB 0b111: –12dB; Note that if the Persistent flag is set, the boosting value applies to the first allocation instance only; [Mo-Han please elaborate as to what you would like say here…]
Nep	4	-
Nsch	4	
SPID	2	
ACID	4	-
AI_SN	1	Initial AI_SN for each ACID
ACK disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the SS in the ACKCH Region (see 8.4.5.4.25). In this case, no ACK channel is allocated for the subburst in the ACKCH Region. For the burst, BS shall not perform HARQ retransmission and MS shall ignore ACID,

		AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.
If (ACK disable== 0) {		
ACK channel	8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
}		
Dedicated DL control Indicator	2	LSB #0 indicates inclusion of CQI control LSB #1 indicates inclusion of Dedicated DL Control IE.
If (LSB #0 of dedicated DL control indicator ==1){		-
Duration (d)	4	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS for 2(d–1) frames. If d is 0b0000, deallocates all CQI feedback when the current ACID is completed successfully. If d is 0b1111, the MS should report until the BS command for the MS to stop.
If (Duration !=0b0000){		
Allocation index	6	Index to the channel in a frame the CQI report should be transmitted by the SS.
Period (p)	3	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS in every 2^p frames.
Frame offset	3	The MS starts reporting at the frame of which the number has the same 3 LSB as the specified frame offset. If the current frame is specified, the MS should start reporting in eight frames.
}		
}		
If (LSB #1 of dedicated DL control indicator ==1){		
Dedicated DL control IE ()	*variable*	
}		
}		
If (Repacking Flag == 1) {		
$\mathbf{N_{EP}}$	4	
Delta Duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will

		be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to 0.
}		

Table YYY – Persistent DL HARQ IR CC Subburst IE format

Syntax	Size (bits)	Notes
Persistent_DL_HARQ_IR_CC_Sub-Burst_IE() {		
N sub burst	4	Number of sub-bursts in the 2D rectangular region is this field value plus 1
For (j=1;j<Number of sub bursts; j++) {		
RCID_IE()	*variable*	--
Allocation Flag	1	1 = allocate 0 = de-allocate
If (Allocation Flag == 0) {		
Repacking Flag	1	0 = no repacking 1 = repacking
if (Repacking Flag ==1) {		
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (Allocation Flag == 1) {		
Persistent Flag	1	0 = non-persistent 1 = persistent
Repacking Flag	1	0 = no repacking 1 = repacking Note: The case of non-persistent should not be repacked.

If (Repacking Flag == 0) {		
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	
If (Persistent Flag == 1) {		
Allocation Period (ap)	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP NACK Channel index	6	Index to a shared MAP NACK channel within the Fast Feedback region
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
}		
Boosting	3	0b000: Normal (not boosted) 0b001: +6dB 0b010: –6dB 0b011: +9dB 0b100: +3dB 0b101: –3dB 0b110: –9dB 0b111: –12dB; Note that if the Persistent flag is set, the boosting value applies to the first allocation instance only; [Mo-Han please elaborate as to what you would like say here…]
Sub-burst DIUC indicator	1	If Sub-Burst DIUC Indicator is 1, it indicates that DIUC is explicitly assigned for this subburst. Otherwise, this subburst will use the same DIUC as the previous subburst. If j is 0 then this indicator shall be 1.
If (Sub-burst DIUC indicator==1) {		
DIUC	4	-
Repetition coding indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
ACID	4	--
AI_SN	1	Initial AI_SN for each ACID
SPID	2	--
ACK disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the SS in the ACKCH Region (see 8.4.5.4.25). In this case, no ACK channel is allocated for the subburst in the ACKCH Region. For the burst, BS shall not perform HARQ retransmission and MS shall ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.
If (ACK disable== 0) {		
ACK channel	8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
}		

Dedicated DL control Indicator	2	LSB #0 indicates inclusion of CQI control LSB #1 indicates inclusion of Dedicated DL Control IE.
If (LSB #0 of dedicated DL control indicator ==1){		-
Duration (d)	4	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS for 2(d–1) frames. If d is 0b0000, deallocates all CQI feedback when the current ACID is completed successfully. If d is 0b1111, the MS should report until the BS command for the MS to stop.
If (Duration !=0b0000){		
Allocation index	6	Index to the channel in a frame the CQI report should be transmitted by the SS.
Period (p)	3	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS in every 2^p frames.
Frame offset	3	The MS starts reporting at the frame of which the number has the same 3 LSB as the specified frame offset. If the current frame is specified, the MS should start reporting in eight frames.
}		
}		
If (LSB #1 of dedicated DL control indicator ==1){		
Dedicated DL control IE ()	*variable*	
}		
}		
If (Repacking Flag == 1) {		
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding

		MSs shall perform repacking using “Delta Duration” field.
Sub-burst DIUC indicator	1	If Sub-Burst DIUC Indicator is 1, it indicates that DIUC is explicitly assigned for this subburst. Otherwise, this subburst will use the same DIUC as the previous subburst. If j is 0 then this indicator shall be 1.
If (Sub-burst DIUC indicator ==1) {		
DIUC	4	-
Repetition coding indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to 0.
}		

Table YYY – Persistent MIMO DL Chase HARQ Subburst IE format

Syntax	**Size (bits)**	**Notes**
Persistent_MIMO_DL_Chase_HARQ_Sub-Burst_IE() {		
N sub burst	4	Number of sub-bursts in the 2D rectangular region is this field value plus 1
Number of ACK channels	6	Number of HARQ ACK enabled subbursts in the 2D region
Repacking Flag	1	0 = no packing 1 = packing Note: The case of non-persistent should not be repacked.
For (j=1;j<Number of sub bursts; j++) {		
MU indicator	1	Indicates whether this DL burst is intended for multiple MS 0 = Single MS 1 = multiple MS
Allocation Flag	1	1 = allocate 0 = de-allocate
Dedicated MIMO Control Indicator	1	0 == MS shall use the stored Dedicated MIMO DL Control information from the last burst allocation where this information was included. 1 = MS uses the Dedicated MIMO DL control information is this IE
If (Allocation Flag == 1) {		
Boosting	3	0b000: Normal (not boosted) 0b001: +6dB 0b010: –6dB 0b011: +9dB 0b100: +3dB 0b101: –3dB 0b110: –9dB 0b111: –12dB; Note that if the Persistent flag is set, the boosting value applies to the first allocation instance only.
}		

If (MU Indicator == 0) {		
If (Allocation flag == 0) {		
RCID	*variable*	--
If (Repacking Flag== 1)		
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (allocation Flag == 1) {		
If (Repacking Flag == 0){		
RCID	*variable*	--
Persistent flag	1	0 = non-persistent allocation 1 = persistent allocation
Duration	*variable*	See definition above in this IE
Slot Offset	*variable*	See definition above in this IE
Dedicated MIMO Control Indicator	1	--
ACK Disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the SS in the ACKCH Region (see 8.4.5.4.24). In this case, no ACK channel is allocated for the subburst in the ACKCH Region. For the burst, BS shall not perform HARQ retransmission and MS shall ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each subburst regardless of the ACK disable bit.
If (persistent flag ==1){		
Allocation Period	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
}		
For (i=0; i<N_Layers;i++) {		
DIUC	4	--
Repetition	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
If (ACK Disable == 0) {		
ACK Channel	8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
}		
ACID	4	--

AI_SN	1	Initial AI_SN for each ACID
}		
}		
If (Repacking Flag == 1) {		
RCID IE ()	*variable*	
DIUC	4	--
Repetition	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
}		
}		
If (MU Indicator == 1) {		
If (Dedicated MIMO control indicator == 1) {		
Dedicated MIMO DL Control IE ()	*variable*	
}		
Layer relevance bit map	4	4 bits bit map indicating if layer processing should be skipped. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer
For (i=0; I<N_Layers; i++) {		
If (Allocation flag == 0) {		De-allocate
RCID IE ()	*variable*	

If (Repacking Flag == 1) {		
Slot Offset	*variable*	See definition above in this IE
}		
}		
If (Allocation Flag == 1) {		
If (Repacking Flag == 0) {		
RCID IE ()	*variable*	
Persistent flag	1	
Slot Offset	*variable*	See definition above in this IE
ACK disable flag	1	See definition above in this IE
DIUC	4	--
Repetition	2	See definition above in this IE
If (ACK Disable == 0) {		
ACK Channel	8	
}		
ACID	4	
AI_SN	1	
If (Persistent Flag == 1) {		
Allocation Period	5	See definition above in this IE
Number of ACID (N_ACID)	3	See definition above in this IE
MS ID	5	See definition above in this IE
Allocation ID	2	See definition above in this IE
MAP ACK Channel Index	6	See definition above in this IE
MAP NACK Channel Index	6	See definition above in this IE
}		
}		
If (Repacking Flag == 1) {		
RCID IE ()	*variable*	
DIUC	4	--
Repetition	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.

Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
}		
}		
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to zero
}		

Table YYY – Persistent MIMO DL IR HARQ Subburst IE format

Syntax	**Size (bits)**	**Notes**
Persistent_MIMO_DL_IR_HARQ_Sub-Burst_IE() {		
N sub burst	4	Number of sub-bursts in the 2D rectangular region is this field value plus 1
Number of ACK channels	6	Number of HARQ ACK enabled subbursts in the 2D region
Repacking Flag	1	0 = no packing 1 = packing Note: The case of non-persistent should not be repacked.
For (j=1;j<Number of sub bursts; j++) {		
MU indicator	1	Indicates whether this DL burst is intended for multiple MS 0 = Single MS 1 = multiple MS
Allocation Flag	1	1 = allocate 0 = de-allocate
Dedicated MIMO Control Indicator	1	0 == MS shall use the stored Dedicated MIMO DL Control information from the last burst allocation where this information was included. 1 = MS uses the Dedicated MIMO DL control information is this IE
If (Allocation Flag == 1) {		
Boosting	3	0b000: Normal (not boosted) 0b001: +6dB 0b010: –6dB 0b011: +9dB 0b100: +3dB 0b101: –3dB 0b110: –9dB 0b111: –12dB; Note that if the Persistent flag is set, the boosting value applies to the first allocation instance only.
}		
If (MU Indicator == 0) {		
If (Allocation flag == 0) {		
RCID	*variable*	--
If (Repacking Flag== 1)		
N_{EP}	4	

N_{SCH}	4	
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (allocation Flag == 1) {		
If (Repacking Flag == 0) {		
RCID	*variable*	--
Persistent flag	1	0 = non-persistent allocation 1 = persistent allocation
N_{EP}	*variable*	See definition above in this IE
N_{SCH}		
Slot Offset	*variable*	See definition above in this IE
Dedicated MIMO Control Indicator	1	--
ACK Disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the SS in the ACKCH Region (see 8.4.5.4.24). In this case, no ACK channel is allocated for the subburst in the ACKCH Region. For the burst, BS shall not perform HARQ retransmission and MS shall ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each subburst regardless of the ACK disable bit.
If (persistent flag ==1){		
Allocation Period	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
}		
For (i=0; i<N_Layers;i++) {		
N_{EP}	4	--
N_{SCH}	4	--
If (ACK Disable == 0) {		
ACK Channel	8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
}		
SPID	2	
ACID	4	--
AI_SN	1	Initial AI_SN for each ACID
}		
If (Repacking Flag == 1){		
RCID IE ()	*variable*	
N_{EP}	4	--
Delta Duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant

		7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
}		
If (MU Indicator == 1) {		
If (Dedicated MIMO control indicator == 1) {		
Dedicated MIMO DL Control IE ()	*variable*	
}		
Layer relevance bit map	4	4 bits bit map indicating if layer processing should be skipped. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer
For (i=0; I<N_Layers; i++) {		
If (Allocation flag == 0) {		
RCID IE ()	*variable*	
If (Repacking Flag == 1) {		
Slot Offset	*variable*	See definition above in this IE
}		
}		
If (Allocation Flag == 1) {		
If (Repacking Flag == 0) {		
RCID IE ()	*variable*	
Persistent flag	1	
Slot Offset	*variable*	See definition above in this IE
ACK disable flag	1	See definition above in this IE
N_{EP}	4	--
N_{SCH}	4	--
If (ACK Disable == 0) {		
ACK Channel	8	--

}		
SPID	2	--
ACID	4	--
AI_SN	1	--
If (Persistent Flag == 1) {		
Allocation Period	5	See definition above in this IE
Number of ACID (N_ACID)	3	See definition above in this IE
MS ID	5	See definition above in this IE
Allocation ID	2	See definition above in this IE
MAP ACK Channel Index	6	See definition above in this IE
MAP NACK Channel Index	6	See definition above in this IE
}		
}		
If (Repacking Flag == 1) {		
RCID IE ()	*variable*	
N_{EP}	4	--
Delta Duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
}		
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to zero
}		

Table YYY – Persistent MIMO DL IR HARQ for CC Subburst IE format

Syntax	Size (bits)	Notes
Persistent_MIMO_DL_IR_HARQ_CC_Sub-Burst_IE() {		
N sub burst	4	Number of sub-bursts in the 2D rectangular region is this field value plus 1
Number of ACK channels	6	Number of HARQ ACK enabled subbursts in the 2D region
Repacking Flag	1	0 = no packing 1 = packing
For (j=1;j<Number of sub bursts; j++) {		
MU indicator	1	Indicates whether this DL burst is intended for multiple MS 0 = Single MS 1 = multiple MS
Allocation Flag	1	1 = allocate 0 = de-allocate
Dedicated MIMO Control Indicator	1	0 == MS shall use the stored Dedicated MIMO DL Control information from the last burst allocation where this information was included. 1 = MS uses the Dedicated MIMO DL control information is this IE
If (Allocation Flag == 1) {		
Boosting	3	0b000: Normal (not boosted) 0b001: +6dB 0b010: –6dB 0b011: +9dB 0b100: +3dB 0b101: –3dB 0b110: –9dB 0b111: –12dB; Note that if the Persistent flag is set, the boosting value applies to the first allocation instance only.
}		
If (MU Indicator == 0) {		
If (Allocation flag == 0) {		
RCID	*variable*	--
If (Repacking Flag== 1)		
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (allocation Flag == 1) {		
If (Repacking Flag == 0) {		
RCID	*variable*	--
Persistent flag	1	0 = non-persistent allocation

		1 = persistent allocation
Duration	*variable*	See definition above in this IE
Slot Offset	*variable*	See definition above in this IE
Dedicated MIMO Control Indicator	1	--
ACK Disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the SS in the ACKCH Region (see 8.4.5.4.24). In this case, no ACK channel is allocated for the subburst in the ACKCH Region. For the burst, BS shall not perform HARQ retransmission and MS shall ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each subburst regardless of the ACK disable bit.
If (persistent flag ==1){		
Allocation Period	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
}		
For (i=0; i<N_Layers;i++) {		
DIUC	4	--
Repetition	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
If (ACK Disable == 0) {		
ACK Channel	8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
}		
ACID	4	--
AI_SN	1	Initial AI_SN for each ACID
SPID	2	
}		
}		
If (Repacking Flag == 1) {		
RCID IE ()	*variable*	
For (i=0; i<N_Layers;i++) {		
DIUC	4	--
Repetition	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE,

		the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
}		
}		
If (MU Indicator == 1) {		
If (Dedicated MIMO control indicator == 1) {		
Dedicated MIMO DL Control IE ()	*variable*	
}		
Layer relevance bit map	4	4 bits bit map indicating if layer processing should be skipped. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer
For (i=0; I<N_Layers; i++) {		
If (Allocation flag == 0) {		
RCID IE ()	*variable*	
If (Repacking Flag == 1) {		
Slot Offset	*variable*	See definition above in this IE
}		
}		
If (Allocation Flag == 1) {		
If (Repacking Flag == 0){		
RCID IE ()	*variable*	
Persistent flag	1	
Slot Offset	*variable*	See definition above in this IE
ACK disable flag	1	See definition above in this IE
DIUC	4	--
Repetition	2	See definition above in this IE
If (ACK Disable == 0) {		
ACK Channel	8	
}		
ACID	4	--
AI_SN	1	--
SPID	2	--
If (Persistent Flag == 1) {		
Allocation Period	5	See definition above in this IE

Number of ACID (N_ACID)	3	See definition above in this IE
MS ID	5	See definition above in this IE
Allocation ID	2	See definition above in this IE
MAP ACK Channel Index	6	See definition above in this IE
MAP NACK Channel Index	6	See definition above in this IE
}		
}		
If (Repacking Flag == 1) {		
RCID IE ()	*variable*	
DIUC	4	--
Repetition	2	See definition above in this IE
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
}		
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to zero
}		

Table YYY – Persistent MIMO DL STC HARQ Subburst IE format

Syntax	**Size**	**Notes**

	(bits)	
Persistent_MIMO_DL_STC_HARQ_Sub-Burst_IE() {		
N sub burst	4	Number of sub-bursts in the 2D rectangular region is this field value plus 1
N ACK Channel	6	Number of HARQ ACK enabled subbursts in the 2D region
For (j=1;j<Number of sub bursts; j++) {		--
Allocation flag	1	--
Repacking Flag	1	
if (allocation Flag == 0) {		// De-allocate
Repacking Flag	1	
RCID_IE ()	*variable*	
If (Repacking Flag ==1) {		// repacking is allowed
Duration		
Slot Offset		
}		
}		
if (allocation flag ==1)		// allocation
If (Repacking Flag == 0) {		
RCID_IE ()	*variable*	
Persistent Flag	1	
If (Persistent Flag == 1) {		
Allocation period (ap)		
MS ID		
Allocation ID		
MAP NACK Channel Index	6	
MAP ACK Channel Index	6	
}		
Boosting	3	--
Tx count	2	--
Duration	*variable*	
Sub-burst offset indication	1	Indicates the inclusion of sub-burst offset
If (Sub-burst offset indication ==1) {		
Sub-burst offset	8	Offset in slots with respect to the previous sub-burst defined in this data region. If this is the first sub-burst within the data region, this offset is with respect to slot 0 of the data region.
}		
ACK disable	1	--
if (Tx count == 0) {		
Dedicated MIMO control indicator	1	--
If (Dedicated MIMO control indictor ==1) {		
DIUC	4	--
Repetition Coding Indicator	2	--
}		
if (ACK disable == 0) {		
ACID	4	--
}		
}		
If (Repacking Flag == 1){		
RCID_IE ()	*variable*	
DIUC	4	
Repetition Coding Indicator	2	
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA

		Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
DIUC	4	--
Repetition Coding Indicator	2	--
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to zero
}		

[Add new section to 8.4.5.4.29]

8.4.5.4.29 HARQ UL MAP Persistent Allocation IE

Table YYY - Persistent HARQ UL MAP IE

Syntax	**Size (bits)**	**Notes**
Persistent HARQ_UL-MAP_IE() {		
Extended 2- UIUC	4	Persistent HARQ_UL-MAP_IE() = 0x0B
Length	8	Length of the IE
RCID Type	2	0b00: Normal CID 0b01: RCID11 0b10: RCID7 0b11: RCID3
Reserved	2	

While (data remains) {	-	-
Mode	3	Indicates the mode of this IE: 0b000: Persistent Chase HARQ 0b001: Persistent Incremental redundancy HARQ for CTC 0b010: Persistent Incremental redundancy HARQ for convolutional code 0b011: Persistent MIMO Chase HARQ 0b100: Persistent MIMO IR HARQ 0b101: Persistent MIMO IR HARQ for convolutional code 0b110: Persistent MIMO STC HARQ 0b111: Reserved
Group ID	4	Group identifier for this Persistent IE
Persistent Change Counter	4	Persistent Change Counter. PCC value is increased by one if the persistent IE includes one or more changes in the corresponding group persistent allocation every allocation period. If there is no change, the PCC value does not increase. If a MS's PCC is not equal to this value, the MS shall transmit a MAP NACK signal in a relevant MAP NACK channel.
Allocation Start Indication	1	0: No allocation start information 1: Allocation start information follows
If (Allocation Start Indication ==1) {	-	-
OFDMA Symbol offset	8	This value indicates start symbol offset of subsequent subbursts in this Persistent HARQ UL MAP IE with reference to the start of the UL sub-frame.
Subchannel offset	7	This value indicates start Subchannel offset of subsequent subbursts in this Persistent HARQ UL MAP IE
Reserved	1	Shall be set to zero
}	-	-
N sub-bursts	4	Number of sub-bursts in this Persistent HARQ UL MAP IE is this field value plus 1.
For (i=0;i<Number of sub-burst; i++) {		
If (mode == 000) {		
Persistent UL HARQ Chase Sub-Burst IE ()		
} else if (mode == 001) {		
Persistent UL HARQ IR CTC Sub-Burst IE ()		
} else if (mode == 010) {		
Persistent UL HARQ IR CC Sub-Burst IE ()		
} else if (mode == 011) {		
Persistent MIMO UL Chase HARQ Sub-Burst IE ()		
} else if (mode == 100) {		
Persistent MIMO UL IR HARQ Sub-Burst IE ()		
} else if (mode == 101) {		
Persistent MIMO UL IR HARQ for CC		

Sub-Burst IE ()		
} else if (mode == 110) {		
Persistent MIMO UL STC HARQ Sub-Burst IE ()		
}		
}		
}		
Padding	*Variable*	Padding to byte; shall be set to 0
}		

Table YYY - Persistent UL HARQ Chase Subburst IE format

Syntax	**Size (bits)**	**Notes**
Persistent UL HARQ Chase Sub-Burst IE {		
RCID_IE()	variable	
Resource Shifting Indicator	1	0 = no resource shifting 1 = resource shifting
Allocation Flag	1	1 = allocate 0 = de-allocate
If (Allocation Flag == 0) {		
if (Resource Shifting Indicator ==1) {		
Duration	Variable	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	Variable	Indicates the start of this persistent allocation in OFDMA slots, with respect to the start of the UL subframe if an allocation start indication is not included in this IE and with respect to OFDM symbol offset and subchannel offset if an allocation start indication is included in this IE OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (Allocation Flag == 1) {		
If (Resource Shifting Indicator == 0) {		
Persistent Flag	1	0 = non-persistent 1 = persistent
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the start of the UL subframe if an allocation start indication is not included in this IE and with respect to OFDM symbol offset and subchannel offset if an

		allocation start indication is included in this IE 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
If (Persistent Flag == 1) {		
Allocation Period (ap)	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
}		
Dedicated UL Control Indicator	1	-
If (Dedicated UL Control Indicator ==1) {		
Dedicated UL Control IE ()	*variable*	
}	-	-
UIUC	4	
Repetition Coding Indication	1	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
ACID	4	-
AI_SN	1	Initial AI_SN for each ACID
ACK Disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the BS in the HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no bit position is allocated for the subburst in the HARQ ACK BITMAP. For the burst, MS shall not perform HARQ retransmission and ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.
}		
If (Resource Shifting Indicator == 1) {		
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking.

		- 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
UIUC	4	
Repetition Coding Indication	1	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
Padding	*variable*	Padding to nibble; shall be set to 0.
}		

Table YYY - Persistent UL HARQ IR CTC Subburst IE format

Syntax	**Size (bits)**	**Notes**
Persistent UL HARQ IR CTC Sub-Burst IE {		
RCID_ID ()	variable	
Allocation Flag	1	1 = allocate 0 = de-allocate
Resource Shifting Indicator	1	0 = no resource shifting 1 = resource shifting
If (Allocation Flag == 0) {		
if (Resource Shifting Indicator ==1) {		
N_{EP}	4	
N_{SCH}	4	
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the start of the UL subframe if an allocation start indication is not included in this IE and with respect to OFDM symbol offset and subchannel offset if an allocation start indication is included in this IE OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		

If (Allocation Flag == 1) {		
If (Resource Shifting Indicator == 0) {		
Persistent Flag	1	0 = non-persistent 1 = persistent
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the start of the UL subframe if an allocation start indication is not included in this IE and with respect to OFDM symbol offset and subchannel offset if an allocation start indication is included in this IE 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
If (Persistent Flag == 1) {		
Allocation Period (ap)	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
}		
Dedicated UL Control Indicator	1	-
If (Dedicated UL Control Indicator ==1) {		
Dedicated UL Control IE ()	*variable*	
}	-	-
N_{EP}	4	-
N_{SCH}	1	-
SPID	10	-
ACID	4	-
AI_SN	1	Initial AI_SN for each ACID
ACK Disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the BS in the HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no bit position is allocated for the subburst in the HARQ ACK BITMAP. For the burst, MS shall not perform HARQ retransmission and ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.
}		
If (Resource shifting indicator == 1) {		

N_{EP}	4	
Delta Duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
}		
}		
Padding	*variable*	Padding to nibble; shall be set to 0.
}		

Table YYY - Persistent UL HARQ IR CC Subburst IE format

Syntax	**Size (bits)**	**Note**
Persistent UL HARQ IR CC Sub-Burst IE {		
RCID IE()	*variable*	--
Allocation Flag	1	1 = allocate 0 = de-allocate
Resource Shifting Indicator	1	0 = no resource shifting 1 = resource shifting
If (Allocation Flag == 0) {		
if (Resource Shifting Indicator ==1) {		
Duration	Variable	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame

		8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	Variable	Indicates the start of this persistent allocation in OFDMA slots, with respect to the start of the UL subframe if an allocation start indication is not included in this IE and with respect to OFDM symbol offset and subchannel offset if an allocation start indication is included in this IE OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (Allocation Flag == 1) {		
If (Resource shifting indicator == 0) {		
Persistent Flag	1	0 = non-persistent 1 = persistent
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the start of the UL subframe if an allocation start indication is not included in this IE and with respect to OFDM symbol offset and subchannel offset if an allocation start indication is included in this IE 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
If (Persistent Flag == 1) {		
Allocation Period (ap)	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
}		
Dedicated UL Control Indicator	1	-
If (Dedicated UL Control Indicator ==1) {		
Dedicated UL Control IE ()	*variable*	
}	-	-
UIUC	4	
Repetition Coding Indication	1	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
SPID	4	-

ACID	4	-
AI_SN	1	Initial AI_SN for each ACID
ACK Disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the BS in the HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no bit position is allocated for the subburst in the HARQ ACK BITMAP. For the burst, MS shall not perform HARQ retransmission and ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.
}		
If (Resource Shifting Indicator == 1) {		
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
UIUC	4	
Repetition Coding Indication	1	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
Padding	*variable*	Padding to nibble; shall be set to 0.
}		

Table YYY – Persistent MIMO UL Chase HARQ Subburst IE format

Syntax	**Size**	**Notes**

	(bits)	
Persistent_MIMO_UL_Chase_HARQ_Sub-Burst_IE() {		
Resource Shifting Indicator	1	0 = no packing 1 = packing
MU Indicator	1	Indicates whether this UL burst is intended for multiple MS 0 = Single MS 1 = multiple MS
Allocation Flag	1	1 = allocate 0 = de-allocate
Dedicated MIMO UL Control Indicator	1	0 == MS shall use the stored Dedicated MIMO UL Control information from the last burst allocation where this information was included. 1 = MS uses the Dedicated MIMO UL control information is this IE
If (MU Indicator == 0) {		
If (Allocation flag == 0) {		
RCID IE()	*variable*	--
If (Resource Shifting Indicator== 1)		
Duration	*variable*	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (Allocation Flag == 1) {		
If(Resource shifting indicator == 0) {		
RCID IE()	*variable*	--
If (Dedicated MIMO UL Control indicator == 1) {		
Dedicated MIMO UL Control IE ()	*variable*	
}		
Persistent Flag	1	0 = non-persistent allocation 1 = persistent allocation
Duration	*variable*	See definition above in this IE
Slot Offset	*variable*	See definition above in this IE
ACK Disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the BS in the HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no bit position is allocated for the subburst in the HARQ ACK BITMAP. For the burst, MS shall not perform HARQ retransmission and ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.

If (persistent flag ==1){		
Allocation Period	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
}		
For (i=0; i<N_Layers;i++) {		
UIUC	4	--
Repetition Coding Indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
If (ACK Disable == 0) {		
ACK Channel	8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
}		
ACID	4	--
AI_SN	1	Initial AI_SN for each ACID
}		
}		
}		
If (Resource Shifting Indicator == 1) {		
RCID IE()	*variable*	--
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value,

		the corresponding MSs shall perform repacking using "Delta Duration" field.
For (i=0; i<N_Layers;i++) {		
UIUC	4	--
Repetition Coding Indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
}		
If (MU Indicator == 1) {		
If (Dedicated MIMO UL Control indicator == 1) {		
Dedicated MIMO UL Control IE ()	*variable*	
}		
Layer Relevance Bitmap	4	4 bit bitmap indicating if layer processing should be skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer
For (i=0; i<N_Layers; i++) {		
If (Allocation flag == 0) {		De-allocate
RCID IE()	*variable*	--
If (Resource Shifting Indicator == 1) {		
Slot Offset	*variable*	See definition above in this IE
Duration	*variable*	See definition above in this IE
}		
}		
If (Allocation Flag == 1) {		
If (Resource shifting indicator == 0){		
RCID IE()	*variable*	--
Persistent flag	1	
Slot Offset	*variable*	See definition above in this IE
Duration	*variable*	See definition above in this IE
ACK Disable	1	See definition above in this IE
UIUC	4	--
Repetition Coding Indication	2	See definition above in this IE
If (ACK Disable == 0) {		
ACK Channel	8	
}		
ACID	4	
AI_SN	1	
If (Persistent Flag == 1) {		
Allocation Period	5	See definition above in this IE
Number of ACID (N_ACID)	3	See definition above in this IE
MAP ACK Channel Index	6	See definition above in this IE
MAP NACK Channel Index	6	See definition above in this IE
}		
}		
If (Resource Shifting Indicator == 1) {		
RCID IE()	*variable*	--
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant

		7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
UIUC	4	--
Repetition Coding Indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to zero
}		

Table YYY – Persistent MIMO UL IR HARQ Subburst IE format

Syntax	**Size (bits)**	**Notes**
Persistent_MIMO_UL_IR_HARQ_Sub-Burst_IE() {		
Resource Shifting Indicator	1	0 = no packing 1 = packing
MU Indicator	1	Indicates whether this UL burst is intended for multiple MS 0 = Single MS 1 = multiple MS
Allocation Flag	1	1 = allocate 0 = de-allocate
Dedicated MIMO UL Control Indicator	1	0 == MS shall use the stored Dedicated MIMO UL

		Control information from the last burst allocation where this information was included. 1 = MS uses the Dedicated MIMO UL control information is this IE
If (MU Indicator == 0) {		
If (Allocation flag == 0) {		
RCID IE ()	*variable*	
If (Resource Shifting Indicator== 1)		
N_{SCH}	4	
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (Allocation Flag == 1) {		
If (Resource shifting indicator == 0) {		
RCID IE ()	*variable*	
If (Dedicated MIMO UL Control indicator == 1) {		
Dedicated MIMO UL Control IE ()	*variable*	
}		
Persistent Flag	1	0 = non-persistent allocation 1 = persistent allocation
N_{SCH}	4	
SPID	2	
N_{EP}	4	
Slot Offset	*variable*	See definition above in this IE
ACK Disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the BS in the HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no bit position is allocated for the subburst in the HARQ ACK BITMAP. For the burst, MS shall not perform HARQ retransmission and ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.
If (persistent flag ==1){		
Allocation Period	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
}		
For (i=0; i<N_Layers;i++) {		
UIUC	4	--
Repetition Coding Indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used

		0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
If (ACK Disable == 0) {		
ACK Channel	8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
}		
ACID	4	--
AI_SN	1	Initial AI_SN for each ACID
}		
If (Resource Shifting Indicator == 1) {		
RCID IE()	*variable*	--
N_{EP}	4	
Delta Duration	4	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
}		
}		
If (MU Indicator == 1) {		
If (Dedicated MIMO UL Control indicator == 1) {		
Dedicated MIMO UL Control IE ()	*variable*	
}		
Layer Relevance Bitmap	4	4 bit bitmap indicating if layer processing should be skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer
For (i=0; i<N_Layers; i++) {		

If (Allocation flag == 0) {		De-allocate
RCID IE ()	*variable*	
If (Resource Shifting Indicator == 1) {		
Slot Offset	*variable*	See definition above in this IE
Duration	*variable*	See definition above in this IE
}		
}		
If (Allocation Flag == 1) {		
If (Resource shifting indicator == 0) {		
RCID IE ()	*variable*	
Persistent flag	1	
Slot Offset	*variable*	See definition above in this IE
Duration	*variable*	See definition above in this IE
ACK Disable	1	See definition above in this IE
UIUC	4	--
Repetition Coding Indication	2	See definition above in this IE
If (ACK Disable == 0) {		
ACK Channel	8	
}		
ACID	4	
AI_SN	1	
If (Persistent Flag == 1) {		
Allocation Period	5	See definition above in this IE
Number of ACID (N_ACID)	3	See definition above in this IE
MAP ACK Channel Index	6	See definition above in this IE
MAP NACK Channel Index	6	See definition above in this IE
}		
If (Resource Shifting Indicator == 1) {		
RCID IE()	*variable*	--
Delta **Duration**	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame

		10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
UIUC	4	--
Repetition Coding Indication	2	See definition above in this IE
}		
}		
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to zero
}		

Table YYY – Persistent MIMO UL IR HARQ for CC Subburst IE format

Syntax	**Size (bits)**	**Notes**
Persistent_MIMO_UL_IR_HARQ_Sub-Burst_IE() {		
Resource Shifting Indicator	1	0 = no packing 1 = packing
MU Indicator	1	Indicates whether this UL burst is intended for multiple MS 0 = Single MS 1 = multiple MS
Allocation Flag	1	1 = allocate 0 = de-allocate
Dedicated MIMO UL Control Indicator	1	0 == MS shall use the stored Dedicated MIMO UL Control information from the last burst allocation where this information was included. 1 = MS uses the Dedicated MIMO UL control information is this IE
If (MU Indicator == 0) {		
If (Allocation flag == 0) {		
RCID IE ()	*variable*	
If (Resource Shifting Indicator== 1)		
N_{SCH}	4	
Slot Offset	*variable*	Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
}		
}		
If (Allocation Flag == 1) {		
If (Resource shifting indicator == 0) {		
RCID IE ()	*variable*	
If (Dedicated MIMO UL Control indicator == 1) {		
Dedicated MIMO UL Control IE ()	*variable*	

}		
Persistent Flag	1	0 = non-persistent allocation 1 = persistent allocation
N_{SCH}	4	
SPID	2	
N_{EP}	4	
Slot Offset	*variable*	See definition above in this IE
ACK Disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the BS in the HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no bit position is allocated for the subburst in the HARQ ACK BITMAP. For the burst, MS shall not perform HARQ retransmission and ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.
If (persistent flag ==1){		
Allocation Period	5	Period of the persistent allocation is this field value plus 1 (unit is frame)
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this persistent assignment is this field value plus 1
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback region
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast Feedback region
}		
For (i=0; i<N_Layers;i++) {		
UIUC	4	--
Repetition Coding Indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
If (ACK Disable == 0) {		
ACK Channel	8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
}		
ACID	4	--
AI_SN	1	Initial AI_SN for each ACID
SPID	4	
}		
If (Resource Shifting Indicator == 1) {		
RCID IE ()	*variable*	
Delta Duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking.

		- 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
For (i=0; i<N_Layers;i++) {		
UIUC	4	--
Repetition Coding Indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
}		
If (MU Indicator == 1) {		
If (Dedicated MIMO UL Control indicator == 1) {		
Dedicated MIMO UL Control IE ()	*variable*	
}		
Layer Relevance Bitmap	4	4 bit bitmap indicating if layer processing should be skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer
For (i=0; i<N_Layers; i++) {		
If (Allocation flag == 0) {		De-allocate
RCID IE ()	*variable*	
If (Resource Shifting Indicator == 1) {		
Slot Offset	*variable*	See definition above in this IE
Duration	*variable*	See definition above in this IE
}		
}		
If (Allocation Flag == 1) {		
If (Resource shifting indicator == 0) {		
RCID IE ()	*variable*	
Persistent flag	1	
Slot Offset	*variable*	See definition above in this IE
Duration	*variable*	See definition above in this IE
ACK Disable	1	See definition above in this IE
UIUC	4	--
Repetition Coding Indication	2	See definition above in this IE
If (ACK Disable == 0) {		
ACK Channel	8	

}		
ACID	4	
AI_SN	1	
SPID	4	
If (Persistent Flag == 1) {		
Allocation Period	5	See definition above in this IE
Number of ACID (N_ACID)	3	See definition above in this IE
MAP ACK Channel Index	6	See definition above in this IE
MAP NACK Channel Index	6	See definition above in this IE
}		
}		
If (Resource Shifting Indicator == 1) {		
RCID IE ()	*variable*	
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
UIUC	4	--
Repetition Coding Indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to zero
}		

Table YYY – Persistent MIMO UL STC HARQ Subburst IE format

Syntax	**Size (bits)**	**Notes**
Persistent_MIMO_UL_STC_HARQ_Sub-Burst_IE() {		
Allocation Flag	1	--
RCID_IE ()	variable	
Resource shifting indicator	1	
if (Allocation Flag == 0) {		// De-allocate
If (Resource Shifting Indicator ==1) {		// resource shifting is allowed
Duration		
Slot Offset		
}		
}		
if (allocation flag ==1)		// allocation
If (Resource shifting indicator == 0) {		
Persistent Flag	1	
If (Persistent Flag == 1) {		
Allocation period (ap)		
MAP NACK Channel Index	6	
MAP ACK Channel Index	6	
}		
Boosting	3	--
Tx count	2	Tx count shall be set to '0' when Persistent Flag is set to '1'.
Duration	*variable*	
Sub-burst offset indication	1	Indicates the inclusion of sub-burst offset
If (Sub-burst offset indication ==1) {		
Sub-burst offset	8	Offset in slots with respect to the previous sub-burst defined in this data region. If this is the first sub-burst within the data region, this offset is with respect to slot 0 of the data region.
}		
ACK disable	1	When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the BS in the HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no bit position is allocated for the subburst in the HARQ ACK BITMAP. For the burst, MS shall not perform HARQ retransmission and ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit.
if (Tx count == 0) {		
UIUC	4	--
Repetition Coding Indicator	2	--
}		
If (ACK disable == 0) {		
ACID	4	--
}		
}		
If (Resource Shifting Indicator == 1) {		
Delta duration	*variable*	Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame

		10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration.
Slot Offset	*variable*	7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field.
UIUC	4	--
Repetition Coding Indication	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
}		
}		
Padding	*variable*	Padding to nibble; shall be set to zero
}		