Project	IEEE 802.16 Broadband Wireless Access Working Group <a href="http://ieee802.org/16">http://ieee802.org/16</a> Reallocation Scheme in Persistent Allocation		
Title			
Date Submitted	2008-03-12		
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		* <http: affiliationfaq.html="" faqs="" stardards.ieee.org=""></http:>	
Re:	Letter Ballot 26b		
Abstract	The resource allocation scheme of 802.166 referred to as periodic allocations).	e is extended to enable persistent allocations (also	
Purpose	Accept the proposed specification changes on IEEE P802.16Rev2/D3.		
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# **Reallocation Scheme in Persistent Allocation**

Sungkyung Kim, Sungcheol chang, Kwangjae Lim, Chulsik Yoon, Seokheon cho, Sunggeun Jin, Hyun Lee, ETRI

# 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 deallocations 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 Notes (bits) Persistent HARQ DL MAP IE () { ---Persistent HARQ DL MAP IE = TBD **Extended-2 DIUC** 4 Length 8 Length in bytes **RCID Type** 2 0b00: Normal CID 0b01: RCID11 0b10: RCID7 0b11: RCID3 While (data remaining) { 0: Region ID not used **Region ID use indicator** 1 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** Indicates sub-burst allocations are time-first 1 rectangular. The duration field in each subburst 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	variable	
for CTC sub-burst IE		
else if (Mode == 0b0010)		
Persistent Incremental redundancy HARQ	variable	
for Convolutional Code		
$else if (Mode == 0b0011) \{$		
Persistent MIMO Chase HARQ	variable	
$else if (Mode == 0b0100) \{$		
Persistent MIMO IR HARQ	variable	
$else if (Mode == 0b0101) \{$		
Persistent MIMO IR HARQ for	variable	
Convolutional Code		
$else if (Mode == 0b0110) \{$		
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	Notes
	(bits)	
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 bursts;="" j++)="" of="" sub="" th="" {<=""><th></th><th></th></number>		
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 $-10 \text{ ms}$ 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
$\frac{\text{If (Persistent Flag == 1) }}{\text{If (Persistent Flag == 1) }}$	-	
Allocation Period (ap)	5	Period of the persistent allocation is this field value plus 1
	2	(unit is frame)
Number of ACID	3	Number of HARQ channels associated with this persistent
(N_ACID)	6	assignment is this field value plus 1 Index to a shared MAP NACK channel within the Fast
MAP NACK Channel	6	
Index MAP ACK Channel Index		Feedback region Index to a MAP ACK channel within the Fast Feedback
MAP ACK Channel Index	6	
)		region
Boosting	3	0b000: Normal (not boosted)
Boosting	3	0b0001: $+6dB$
		0b010: -6dB
		0b010: -0dB
		0b100: +3dB
		0b101: -3dB
		0b110: -9dB
		0b111: -12dB;
		00111. –1200,
		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
	1	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	1	
indicator $==1)$ {		
DIUC	4	-
Repetition coding	2	0b00: No Repetition coding
indication		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
		, are anotated bubbarbt 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.
	2	
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 <sup>p</sup> 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 ()	variabl	
	е	
}		
}		
If (Repacking Flag == 1) {		Difference of denotion between the 11 of the 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
		<ul> <li>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.</li> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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</li> </ul>

		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	<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> </ul>
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	variabl e	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 bursts;="" j++)="" of="" sub="" td="" {<=""><td></td><td></td></number>		
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) {		
$\mathbf{N_{EP}}$	4	
N <sub>SCH</sub>	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
Ũ		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 <sub>EP</sub>	4	
N <sub>SCH</sub>	4	
Slot Offset	variable	Indicates the start of this persistent allocation in OFDMA
Slot Olise	variable	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) {		10  bits - 20  ins frame
Allocation Period (ap)	5	Daried of the manufacture allocation is this field value mine 1
Anocation Period (ap)	3	Period of the persistent allocation is this field value plus 1 (unit is frame)
	2	
Number of ACID (N_ACID)	3	Number of HARQ channels associated with this
	<i>.</i>	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
If (ACK disable== 0) {		sub-burst regardless of the ACK disable bit.
ACK channel	8	Indicates the ACK channel to be used for this sequence
ACK channel	0	of sub-bursts as defined in 8.4.5.4.25.
}		
Dedicated DL control Indicator	2	LSB #0 indicates inclusion of CQI control
Deticated DE control indicator	2	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 <sup>p</sup> 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	
	Variable	
}		
If (Repacking Flag == 1) {		
N <sub>EP</sub>	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.
		otherwise, the two shan interpret this field as repacking.
		- 1 MSB: 0 == extension, 1 == shrink
		<ul> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>Other LSBs: the difference of duration between new</li> </ul>
		- Other LSBs: the difference of duration between new
		- Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent
		- Other LSBs: the difference of duration between new

		be reduced by the difference of duration.
Slot Offset	variable	<ul> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> </ul>
}		
}		
Padding }	variable	Padding to nibble; shall be set to 0.

Table YYY - Persistent DL HARQ IR CC Subburst IE format

Syntax	Size	Notes
	(bits)	
Persistent_DL_HARQ_IR_CC_Sub-Burst_IE() {	(2205)	
N sub burst	4	Number of sub-bursts in the 2D rectangular region is this field value plus 1
For (j=1;j <number bursts;="" j++)="" of="" sub="" td="" {<=""><td></td><td></td></number>		
RCID_IE()	variabl e	
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) {	ļ	
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
Sub-burst DIUC indicator	1	as to what you would like say here] 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
}	4	
ACID AI SN	4	 Initial AI_SN for each ACID
SPID	1 2	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) {	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
Deulcated DL control mulcator	2	LSB #0 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 <sup>p</sup> 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){		
<b>Dedicated DL control IE</b> ()	variabl e	
}	e	
}		
If (Repacking Flag == 1) {		
Delta duration	variable	<ul> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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.</li> </ul>
Slot Offset	variable	<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>This value indicates the first slot index of the MS to be</li> <li>reallocated. This MS's RCID is equal to the value of RCID_IE.</li> <li>If one's slot offset is higher than this value, the corresponding</li> </ul>

		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	variabl	Padding to nibble; shall be set to 0.
-	е	-
}		

# 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 bursts;="" j++)="" of="" sub="" td="" {<=""><td></td><td></td></number>		
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: +6dB0b010: -6dB0b011: +9dB0b100: +3dB0b101: -3dB0b110: -9dB0b111: -12dB;Note that if the Persistent flag is set, the boosting value applies to the first allocation instance only.
}		

variable	
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
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
variable	
1	0 = non-persistent allocation
	1 = persistent allocation
variable	See definition above in this IE
variable	See definition above in this IE
1	
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.
5	Period of the persistent allocation is this field value plus 1 (unit is frame)
3	Number of HARQ channels associated with this
	persistent assignment is this field value plus 1
6	Index to a MAP ACK channel within the Fast Feedback region
6	Index to a shared MAP NACK channel within the Fast Feedback region
4	
2	0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
1	
8	Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25.
8	
	variable 1 variable variable 1 1 1 5 3 6 6 6 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	<ul> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- 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.</li> </ul>
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	<ul> <li>4 bits bit map indicating if layer processing should be skipped. The bit position indicates the layer. The bit value:</li> <li>0 = skip the layer;</li> <li>1 = process the layer</li> </ul>
For (i=0; I <n_layers; i++)="" td="" {<=""><td></td><td></td></n_layers;>		
If (Allocation flag == 0) {		De-allocate
RCID IE ()	variable	

	1	[]
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	
DIUC Repetition	4 2	 0b00: No Repetition coding
		 0b00: No Repetition coding 0b01: Repetition coding of 2 used
		0b01: Repetition coding of 2 used
		0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used
Repetition	2	0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
Repetition	2	0b01: Repetition coding of 2 used0b10: Repetition coding of 4 used0b11: Repetition coding of 6 usedDifference of duration between previous allocation and
Repetition	2	0b01: Repetition coding of 2 used0b10: Repetition coding of 4 used0b11: Repetition coding of 6 usedDifference of duration between previous allocation andnewly allocation (reallocation) in slots. OFDMA Frame
Repetition	2	0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant
Repetition	2	0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame
Repetition	2	0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used 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
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>This field provides information about both reallocation</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- Other LSBs: the difference of duration between new</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- 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</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- 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</li> </ul>
Repetition	2	<ul> <li>0b01: Repetition coding of 2 used</li> <li>0b10: Repetition coding of 4 used</li> <li>0b11: Repetition coding of 6 used</li> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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</li> </ul>

Slot Offset	variable	<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> </ul>
}		
}		
}		
}		
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 bursts;="" j++)="" of="" sub="" td="" {<=""><td></td><td></td></number>		
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 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 <sub>EP</sub>	4	

N <sub>SCH</sub>	4	
Slot Offset	variable	Indicates the start of this persistent allocation in
Slot Offset	rantaote	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
1		
}		
If (allocation Flag == 1) {		
If (Repacking Flag == 0) {		
RCID	variable	
Persistent flag	1	0 = non-persistent allocation
i cisistent nag	1	1 = persistent allocation
N <sub>EP</sub>	variable	See definition above in this IE
N <sub>SCH</sub>		
Slot Offset	variable	See definition above in this IE
	1	
Dedicated MIMO Control Indicator	1	 When ACK Dischlar 1, the allocated authorst does not
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
	5	persistent assignment is this field value plus 1
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast Feedback
MAI ACK Chainer mutz	0	region
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within the Fast
	0	Feedback region
}		
For (i=0; i <n_layers;i++) td="" {<=""><td></td><td></td></n_layers;i++)>		
N <sub>EP</sub>	4	
N <sub>SCH</sub>	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 <sub>EP</sub>	4	
Delta Duration	variable	Difference of duration between previous allocation and
		newly allocation (reallocation) in slots. OFDMA Frame

Γ		
		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.
		<ul> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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.</li> </ul>
Slot Offset	variable	<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> </ul>
}		
If (MU Indicator == 1) {		
If (Dedicated MIMO control indicator == 1) {		
Dedicated MIMO control IE ()	variable	
	variable	
Layer relevance bit map	4	<ul> <li>4 bits bit map indicating if layer processing should be skipped. The bit position indicates the layer. The bit value:</li> <li>0 = skip the layer;</li> <li>1 = process the layer</li> </ul>
For (i=0; I <n_layers; i++)="" th="" {<=""><th></th><th></th></n_layers;>		
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 <sub>EP</sub>	4	
N <sub>SCH</sub>	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 <sub>EP</sub>	4	
Delta Duration	variable	<ul> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- 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.</li> </ul>
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.
		1
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()	(200)	
{		
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 bursts;="" j++)="" of="" sub="" td="" {<=""><td></td><td></td></number>		
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	<ul> <li>0 == MS shall use the stored Dedicated MIMO DL</li> <li>Control information from the last burst allocation where this information was included.</li> <li>1 = MS uses the Dedicated MIMO DL control information is this IE</li> </ul>
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) { $ \int \int$		
If (Allocation flag == 0) {	• 11	
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 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++) th="" {<=""><th>4</th><th></th></n_layers;i++)>	4	
DIUC	4 2	
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++) th="" {<=""><th></th><th></th></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
}	ļ	
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,

Slot Offset	variable	7 bits $-2.5$ ms frame
		<ul> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> </ul>
}		
}		
If (MU Indicator == 1) {		
If (Dedicated MIMO control indicator == 1)		
Dedicated MIMO DL Control IE ()	variable	
Layer relevance bit map	4	<ul> <li>4 bits bit map indicating if layer processing should be skipped. The bit position indicates the layer. The bit value:</li> <li>0 = skip the layer;</li> <li>1 = process the layer</li> </ul>
For $(i=0; I < N Lavers; i++)$		
	variable	
	variahle	See definition above in this IE
}		
}		
If (Allocation Flag == 1) {	1	
	1	
If (Repacking Flag $== 0$ ){		
If (Repacking Flag == 0){ <b>RCID IE</b> ()	variable	
RCID IE ()	variable 1	
RCID IE () Persistent flag		See definition above in this IE
RCID IE ()         Persistent flag         Slot Offset	1	See definition above in this IE See definition above in this IE
RCID IE () Persistent flag	1 variable	
RCID IE ()         Persistent flag         Slot Offset         ACK disable flag	1 variable 1	See definition above in this IE
RCID IE ()         Persistent flag         Slot Offset         ACK disable flag         DIUC	1 <i>variable</i> 1 4	See definition above in this IE 
RCID IE ()         Persistent flag         Slot Offset         ACK disable flag         DIUC         Repetition	1 <i>variable</i> 1 4	See definition above in this IE 
RCID IE ()         Persistent flag         Slot Offset         ACK disable flag         DIUC         Repetition         If (ACK Disable == 0) {	1 variable 1 4 2	See definition above in this IE 
RCID IE ()         Persistent flag         Slot Offset         ACK disable flag         DIUC         Repetition         If (ACK Disable == 0) {	1 variable 1 4 2	See definition above in this IE 
RCID IE ()         Persistent flag         Slot Offset         ACK disable flag         DIUC         Repetition         If (ACK Disable == 0) {         ACK Channel         }	1 variable 1 4 2 8	See definition above in this IE  See definition above in this IE
RCID IE ()         Persistent flag         Slot Offset         ACK disable flag         DIUC         Repetition         If (ACK Disable == 0) {         ACK Channel         }         ACID	1 variable 1 4 2 2 8 8 4	See definition above in this IE  See definition above in this IE 
RCID IE ()         Persistent flag         Slot Offset         ACK disable flag         DIUC         Repetition         If (ACK Disable == 0) {         ACK Channel         }         ACID         AI_SN	1 variable 1 4 2 2 8 8 4 1	See definition above in this IE See definition above in this IE
For (i=0; I <n_layers; i++)="" td="" {<="">         If (Allocation flag == 0) {         RCID IE ()         If (Repacking Flag == 1) {         Slot Offset         }         ]         If (Allocation Flag == 1) {</n_layers;>	variable variable	See definition above in this IE

	2	
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.
		<ul> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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.</li> </ul>
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.
}		
}		
}	1	
Padding	variable	Padding to nibble; shall be set to zero

# Table YYY – Persistent MIMO DL STC HARQ Subburst IE format

Syntax	Size	Notes
	26	

	(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 bursts;="" j++)="" of="" sub="" td="" {<=""><td></td><td></td></number>		
Allocation flag	1	
Repacking Flag	1	
if (allocation Flag == 0) {		// De-allocate
Repacking Flag	1	
RCID_IE ()	variable	
If (Repacking Flag ==1) {	variable	// repacking is allowed
Duration		
Slot Offset		
}		
if (allocation flag ==1)		// allocation
$\frac{11 \text{ (allocation flag == 1)}}{\text{ If (Repacking Flag == 0) }}$		// allocation
$\frac{11}{\text{RCID_IE}} ()$		
	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 dat region, this offset is with respect to slot 0 of the data region.
}		
ACK disable	1	
if $(Tx \text{ count} == 0)$ {		
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 an
		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
		<ul> <li>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.</li> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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.</li> </ul>
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
		<i>D i</i>

[Add new section to 8.4.5.4.29]

# 8.4.5.4.29 HARQ UL MAP Persistent Allocation IE

Table Y Y Y - 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			

Table YYY - Persistent HARQ UL MAP IE

While (data remains) {		-
Mode	- 3	Indicates the mode of this IE:
Moue	5	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 i++)="" of="" sub-burst;="" th="" {<=""><td></td><td></td></number>		
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		
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
}		

<u> </u>	Notes
variable	
1	0 = no resource shifting
-	1 = resource shifting
1	1 = allocate
	0 = de-allocate
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
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
1	0 = non-persistent
	1 = persistent
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
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
	Variable

#### Table YYY - Persistent UL HARQ Chase Subburst IE format

	1	
		allocation start indication is included in this IE
		7 bits $-2.5$ ms frame
		8 bits – 5 ms frame
		9  bits - 10  ms frame
If (Demi-tent Electron 1) (		10 bits – 20 ms frame
If (Persistent Flag == 1) {	5	
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
Nulliber of ACID (N_ACID)	5	persistent assignment is this field value plus 1
MAP NACK Channel Index	6	Index to a shared MAP NACK channel within
WAI WACK Channel Index	0	the Fast Feedback region
MAP ACK Channel Index	6	Index to a MAP ACK channel within the Fast
WAI ACK Chamler mutx	0	Feedback region
1		
Dedicated UL Control Indicator	1	-
If (Dedicated UL Control Indicator	1	
$==1) \{$		
Dedicated UL Control IE ()	variable	
	variable	
	4	
Repetition Coding Indication	1	0b00: No Repetition coding
Repetition County Indication	1	0b01: Repetition coding of 2 used
		0b10: Repetition coding of 4 used
4 (11)		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
		slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame
		7 bits $-2.5$ ms frame
		7 bits – 2.5 ms frame 8 bits – 5 ms frame
		7 bits $-2.5$ ms frame
		7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame
		7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame
		<ul> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>This field provides information about both</li> </ul>
		<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>This field provides information about both reallocation and repacking. In case that RCID of</li> </ul>
		<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is</li> </ul>
		<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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</li> </ul>
		<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> </ul>
		<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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</li> </ul>

		<ul> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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.</li> </ul>
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
<b>Resource Shifting Indicator</b>	1	0 = no resource shifting
		1 = resource shifting
If (Allocation Flag == 0) {		
if (Resource Shifting Indicator ==1) {		
$\mathbf{N}_{\mathbf{EP}}$	4	
N <sub>SCH</sub>	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	<ul> <li>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</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> </ul>
		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) {		
<b>Dedicated UL Control IE</b> ()	variable	
}	-	-
N <sub>EP</sub>	4	-
N <sub>SCH</sub>	1	-
SPID ACID	10	-
ACID	4	-
AI_SN ACK Disable	1	Initial AI_SN for each ACIDWhen ACK Disable == 1, the allocatedsubburst does not require an ACK to betransmitted by the BS in the HARQ ACKBITMAP (see 8.4.5.3.22). In this case, no bitposition is allocated for the subburst in theHARQ ACK BITMAP. For the burst, MSshall not perform HARQ retransmission andignore ACID, AI_SN and SPID, which shallbe set to 0 by BS if they exist. The CRC shallbe appended at the end of each sub-burstregardless of the ACK disable bit.
}		-
If (Resource shifting indicator $== 1$ ) {		

N <sub>EP</sub>	4	
Delta Duration	variable	<ul> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- 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.</li> </ul>
Slot Offset	variable	<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> </ul>
}		
Padding	variable	Padding to nibble; shall be set to 0.
}	vurius/te	r adding to moore, shall be set to 0.

### Table YYY - Persistent UL HARQ IR CC Subburst IE format

Syntax	Size	Note
	(bits)	
Persistent UL HARQ IR CC Sub-Burst IE {		
RCID IE()	variable	
Allocation Flag	1	1 = allocate
		0 = de-allocate
<b>Resource Shifting Indicator</b>	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

	1	
		8 bits – 5 ms frame
		9 bits – 10 ms frame
	¥7 · 11	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 Eleg 1) (		
If (Allocation Flag == 1) { If (Resource shifting indicator == 0) {		
Persistent Flag	1	0 - non parcistant
i ci sistent f lag	1	0 = non-persistent 1 = persistent
Duration	variable	Duration in slots. OFDMA Frame duration dependant
Durution	<i>runuon</i> e	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
	2	(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	
<b>Repetition Coding Indication</b>	1	0b00: No Repetition coding
		0b01: Repetition coding of 2 used
		0b10: Repetition coding of 4 used
CDID	4	0b11: Repetition coding of 6 used
SPID	4	-

ACID	4	-
AL_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	<ul> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- 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.</li> </ul>
Slot Offset	variable	<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> </ul>
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()		
{		
<b>Resource Shifting Indicator</b>	1	0 = no packing
	1	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)	variable	Duration in alota OEDMA Energy dependient day 1 (
Duration	variable	Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame
		7  bits = 2.3  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
	rantable	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 (All		
$\frac{\text{If (Allocation Flag == 1) }}{\text{If (Passures shifting in disator = 0) }}$		
If (Resource shifting indicator == 0) { $P(D   E(0))$	nariable	
RCID IE() If (Dedicated MIMO UL Control	variable	
indicator == 1) {		
Dedicated MIMO UL Control	variable	
IE ()	<i>variable</i>	
}		
Persistent Flag	1	0 = non-persistent allocation
U		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++) th="" {<=""><th></th><th></th></n_layers;i++)>		
UIUC	4	
<b>Repetition Coding Indication</b>	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
}		
J		
)		
If (Resource Shifting Indicator == 1) {		
RCID IE()	u ani ablo	
Delta duration	variable variable	Difference of duration between previous allocation and
		<ul> <li>newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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.</li> </ul>
Slot Offset	variable	<ul> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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,</li> </ul>

		the corresponding MSs shall perform repacking using "Delta Duration" field.
For (i=0; i <n_layers;i++) td="" {<=""><td></td><td></td></n_layers;i++)>		
	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) {		
<b>Dedicated MIMO UL Control IE ()</b>	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++)="" td="" {<=""><td></td><td></td></n_layers;>		
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	
<b>Repetition Coding Indication</b>	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) {	• 11	
RCID IE()	variable	   D'00 0.1 // 1 // 1 // 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.
		<ul> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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.</li> </ul>
Slot Offset	variable	7 bits – 2.5 ms frame
Site Offset	variable	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	Notes
	(bits)	
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
If (MU Indicator == 0) {		information is this IE
$\frac{1}{1} \text{ If (Allocation flag == 0) } \{$		
RCID IE ()	variable	
If (Resource Shifting Indicator== 1)	variable	
N <sub>SCH</sub>	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
N T		1 = persistent allocation
N <sub>SCH</sub>	4	
SPID	2 4	
N <sub>EP</sub>		
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	Derived of the persistent allocation is this field value where
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++) td="" {<=""><td></td><td></td></n_layers;i++)>		
UIUC	4	
<b>Repetition Coding Indication</b>	2	0b00: No Repetition coding 0b01: Repetition coding of 2 used

Ob10: Repetition coding of 4 used           0b11: Repetition coding of 4 used           1           ACID           4           Nrp           4           Delta Duration           4           Delta Duration           4           10 bits - 20 ms frame           9 bits - 10 ms frame           10 bits - 20 ms frame </th <th></th>	
If (ACK Disable == 0) {       8       Indicates the ACK channel to be used for this set of sub-bursts as defined in 8.4.5.4.25.         ACED       4          AL_SN       1       Initial AL SN for each ACID         }       4       Delta Duration       4         Delta Duration       4       Difference of duration between previous allocati newly allocation (reallocation) in slots. OFDM duration dependant 7 bits - 2.5 ms frame 8 bits - 5 ms frame 9 bits - 10 ms frame 10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms allocation. It can also re the anount of repacking. In case of extension case slot offset of the MS to be repacked will be incrude the first of the MS to be repacked will be incrude the first of the MS to be repacked will be incrude the difference of duration.         Slot Offset       variable       7 bits - 2.5 ms frame 8	
ACK Channel       8       Indicates the ACK channel to be used for this set of sub-bursts as defined in 8.4.5.4.25.         ACID       4          AL SN       1       Initial AL_SN for each ACID         }       4	
of sub-bursts as defined in 8.4.5.4.25.         ACID       4         ALSN       1         Initial ALSN for each ACID         1       1         If (Resource Shifting Indicator == 1) {         RCID IE()       variable         Nup       4         Delta Duration       4	
ALSN       1       Initial ALSN for each ACID         ]	Juence
AI_SN       1       Initial AI_SN for each ACID         }       ]	
If (Resource Shifting Indicator == 1) {       variable         RCID IE()       variable         Ngp       4         Delta Duration       4         Difference of duration between previous allocatinewly allocation (reallocation) in slots. OFDM duration dependant 7 bits - 2.5 ms frame 8 bits - 5 ms frame 8 bits - 5 ms frame 10 bits - 20 ms frame         Mark 10 bits - 20 ms frame       8 bits - 10 ms frame 10 bits - 20 ms frame         Mark 10 bits - 20 ms frame       7 bits - 20 ms frame         Mark 10 bits - 20 ms frame       10 bits - 20 ms frame         Nue. Otherwise, the MS shall interpret this fiel repacking. In case that RCID of a MS involve the persistent allocation is equal to a value of RC the MS shall update allocation. It can also represerve will be increased in the difference of duration between allocation and previous allocation. It can also represerve allocation and previous allocation. It can also represerve allocation and previous allocation. It can also represerve 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	
RCD IE()       variable          Ngp       4       Jifference of duration between previous allocation in slots. OFDM duration dependant newly allocation (reallocation) in slots. OFDM duration dependant 7 bits - 2.5 ms frame         8 bits - 5 ms frame       8 bits - 5 ms frame         9 bits - 10 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       7 bits - 10 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms fra	
RCD IE()       variable          Ngp       4       Jifference of duration between previous allocation in solots. OFDM duration dependant newly allocation (reallocation) in slots. OFDM duration dependant 7 bits - 2.5 ms frame       B bits - 5 ms frame         9 bits - 10 ms frame       10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame       10 bits - 00 ms frame         10 bits - 10 ms frame       10 bits - 20 ms frame       10 bits - 00 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame       10 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame       10 bits - 20 ms frame         10 bits - 20 ms frame       10 bits - 20 ms frame       10 ms frame         10 bits - 20 ms frame       10 ms frame       10 centerse of duration betweer allocation and previous allocation. 1 cen also representing. In case of extension case slot offset of the MS to be repacked will be increating. In case of extension case slot offset of the MS to be repacked will be increating. In case of extension case slot offset of the MS to be repacked will be increating. In case of extension case slot offset of the MS to be repacked will be increating. In case of extension case slot offset - 2.5 ms frame         8 bits - 5 ms frame       9 bits - 10 ms frame<	
NFP       4         Delta Duration       4         Delta Duration       4         Difference of duration between previous allocation in why allocation (reallocation) in slots. OFDM duration dependant         7 bits - 2.5 ms frame         8 bits - 10 ms frame         9 bits - 10 ms frame         10 bits - 20 ms frame <t< td=""><td></td></t<>	
Delta Duration       4       Difference of duration between previous allocatinewly allocation (reallocation) in slots. OFDM duration dependant         7       bits - 2.5 ms frame       8 bits - 5 ms frame         9       bits - 10 ms frame       10 bits - 20 ms frame         10       bits - 20 ms frame       10 bits - 20 ms frame         10       bits - 10 ms frame       10 bits - 20 ms frame         10       bits - 10 ms frame       10 bits - 20 ms frame         11       MSB: 0 == extension about both realle and repacking. In case that RCID of a MS involute between allocation information from value. Otherwise, the MS shall update allocation information from value. Otherwise, the MS shall interpret this fiel repacking.         - 1       MSB: 0 == extension, 1 == shrink         - Other LSBs: the difference of duration between allocation and previous allocation. It can also repacked will be incret the difference of duration.         Slot Offset       variable         7       bits - 2.5 ms frame         8       bits - 5 ms frame         8       bits - 5 ms frame         9       bits - 0 duration.         10       ms frame         10       bits - 0 ms frame         10       bits - 5 ms frame         10       bits - 5 ms frame         10       bits - 5 ms frame         10       bi	
slot Offset       variable         Slot Offset       variable         8 bits = 5 ms frame       9 bits = 10 ms frame         10 bits = 20 ms frame       10 bits = 20 ms frame         10 bits = 20 ms frame       10 bits = 20 ms frame         10 bits = 20 ms frame       10 bits = 20 ms frame         10 bits = 20 ms frame       10 bits = 20 ms frame         10 bits = 20 ms frame       10 bits = 20 ms frame         10 bits = 20 ms frame       10 bits = 20 ms frame         10 bits = 20 ms frame       10 bits = 20 ms frame         10 ms frame       10 ms frame         10 bits = 20 ms frame       10 bits = 0 ms frame         10 bits = 0 ms frame       10 bits = 0 ms frame         10 bits = 0 ms frame       10 bits = 0 ms frame         10 bits = 0 ms frame       10 bits = 0 ms frame         10 bits = 0 ms frame       10 bits = 0 ms frame         10 bits = 0 ms frame<	
8 bits – 5 ms frame         9 bits – 10 ms frame         10 bits – 20 ms frame         10 bits – 20 ms frame         This value indicates the first slot index of the MS         reallocated. This MS's RCID is equal to the value         RCID_IE. If one's slot offset is higher than this value         the corresponding MSs shall perform repacking means         "Delta Duration" field.         }         If (MU Indicator == 1) {	A Frame cation red in CID_IE, this l as new resent se, the ased by
	e of value,
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 skipped in the subsequent 'for loop'. The bit per indicates the layer. The bit value:         0 = skip the layer;       1 = process the layer	
For (i=0; i <n_layers; i++)="" td="" {<=""><td></td></n_layers;>	

$\mathbf{If} (\mathbf{A} 1 1_{\mathbf{a}} 1_{\mathbf{a}}$	[	De alla acta
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	
	0	
ACID	4	
	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	<ul> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- 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.</li> </ul>
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 <sub>SCH</sub>	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) {		
$\frac{11 (Resource snifting indicator == 0) {}}{\mathbf{RCID IE} ()}$	variable	
If (Dedicated MIMO UL Control	variable	
indicator == 1) {		
Dedicated MIMO UL Control IE ()	variable	

1		
Persistent Flag	1	0 = non-persistent allocation
r ersistent riag	1	1 = persistent allocation
N <sub>SCH</sub>	4	
SPID	2	
	4	
N <sub>EP</sub>		Car definition shows in this IF
Slot Offset ACK Disable	variable 1	See definition above in this IE 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++) th="" {<=""><th></th><th></th></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
	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.

	T	
		<ul> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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.</li> </ul>
Slot Offset	variable	<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> </ul>
For (i=0; i <n_layers;i++) th="" {<=""><th>4</th><th></th></n_layers;i++)>	4	
UIUC Repetition Coding Indication	4 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	<ul> <li>4 bit bitmap indicating if layer processing should be skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value:</li> <li>0 = skip the layer;</li> <li>1 = process the layer</li> </ul>
For (i=0; i <n_layers; i++)="" th="" {<=""><th></th><th></th></n_layers;>		
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 (B_{\text{Flag}} = 1) $		
If (Resource shifting indicator == 0) {	namial.	
RCID IE ()	variable	
Persistent flag Slot Offset	ı 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) {	2	
	1	
ACK Channel	8	

	1	
}		
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	<ul> <li>Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant</li> <li>7 bits - 2.5 ms frame</li> <li>8 bits - 5 ms frame</li> <li>9 bits - 10 ms frame</li> <li>10 bits - 20 ms frame</li> <li>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.</li> <li>- 1 MSB: 0 == extension, 1 == shrink</li> <li>- 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.</li> </ul>
Slot Offset	variable	<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> </ul>
	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
}		
	1	

Syntax	Size	Notes
Syntax	(bits)	10005
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 $(Tx \text{ count} == 0)$ {		
UIUC	4	
<b>Repetition Coding Indicator</b>	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
	/8	9 bits – 10 ms frame

### Table YYY - Persistent MIMO UL STC HARQ Subburst IE format

		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.
		<ul> <li>1 MSB: 0 == extension, 1 == shrink</li> <li>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.</li> </ul>
Slot Offset	variable	<ul> <li>7 bits – 2.5 ms frame</li> <li>8 bits – 5 ms frame</li> <li>9 bits – 10 ms frame</li> <li>10 bits – 20 ms frame</li> <li>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.</li> </ul>
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
}		