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

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.

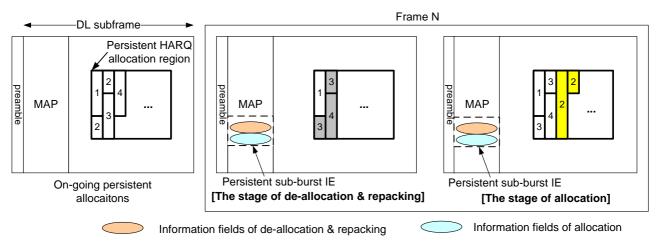


Figure 1. De-allocation/allocation for the extension of MS-2's persistent resource

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.

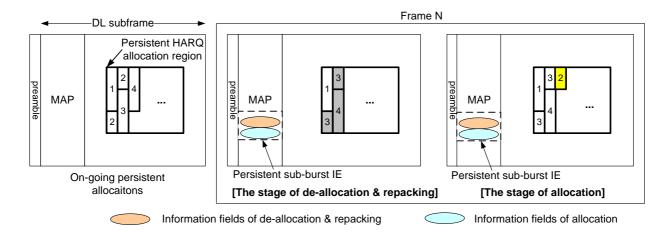


Figure 2. De-allocation/allocation for the shrink of MS-2's persistent resource

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.

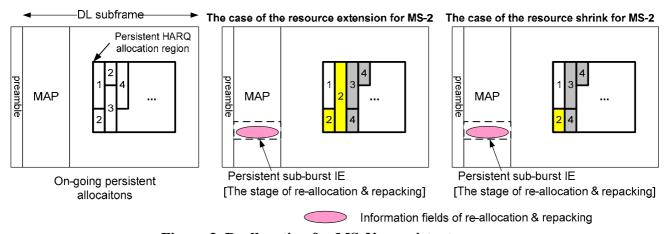


Figure 3. Reallocation for MS-2's persistent resource

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.

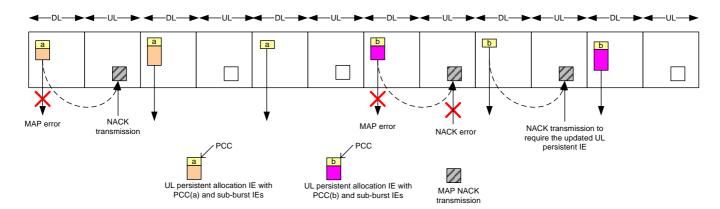


Figure 4. Persistent Chang Counter in UL sub-frame.

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 HARO DL MAP allocation IE

| Table XXX: Persistent HARQ DL MAP allocation IE | | | |
|---|-------------|--|--|
| Syntax | Size (bits) | Notes | |
| Persistent HARQ DL MAP IE () { | | | |
| Extended-2 DIUC | 4 | Persistent HARQ DL MAP IE = TBD | |
| Length | 8 | Length in bytes | |
| RCID Type | 2 | 0b00: Normal CID 0b01: RCID11 0b10: RCID7 0b11: RCID3 | |
| While (data remaining) { | | | |
| Region ID use indicator | 1 | 0: Region ID not used 1: Region ID used | |
| if (Region ID use indicator ==0) { | | | |
| OFDMA Symbol offset | 8 | Offset from the start of DL sub-frame | |
| Subchannel offset | 7 | | |
| Number of OFDMA symbols | 7 | | |
| Number of subchannels | 7 | | |
| Rectangular sub-burst indication | 1 | Indicates sub-burst allocations are time-first rectangular. The duration field in each sub-burst IE specifies the number of subchannels for each rectangular allocation. This is only valid for AMC allocations and all allocations with dedicated pilots. When this field is clear, sub-bursts shall be allocated in frequency-first manner and the duration field reverts to the default operation | |
| } else { | | | |
| Region ID | 8 | Index to the DL region defined in DL region definition TLV in DCD | |
| } | | | |
| Mode | 4 | Indicates the mode in this HARQ region 0b0000: Persistent Chase HARQ 0b0001: Persistent Incremental redundancy HARQ for CTC 0b0010: Persistent Incremental redundancy HARQ for Convolutional Code 0b0011: Persistent MIMO Chase HARQ 0b0100: Persistent MIMO IR HARQ 0b0101: Persistent MIMO IR HARQ for Convolutional Code 0b0110: Persistent MIMO STC HARQ 0b0111: 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 | | |
| $ellet = 0b0010$ { | | |
| 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. |
| } | | Shan 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 of sub bursts; $j++)$ { | | |
| Allocation Flag | 1 | 1 = allocate |
| | | 0 = de-allocate |
| RCID_IE() | variable | |
| If (Allocation Flag $== 0$) { | | |
| Repacking Flag | 1 | 0 = no repacking |
| | | 1 = repacking |
| if (Repacking Flag ==1) { | | |
| Duration | variable | Duration in slots. OFDMA Frame duration dependant |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| Slot Offset | variable | Indicates the start of this persistent allocation in OFDMA |
| | | slots, with respect to the lowest numbered OFDM symbol |
| | | and the lowest numbered subchannel in the HARQ region. |
| | | OFDMA Frame duration dependant |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |

| | | 10 bits – 20 ms frame |
|-------------------------------------|----------|---|
| } | | 20 333 20 333 23 33 33 33 33 33 33 33 33 33 33 33 |
| } | | |
| If (Allocation Flag == 1) { | | |
| Persistent Flag | 1 | 0 = non-persistent 1 = persistent |
| Repacking Flag | 1 | 0 = no repacking |
| 1 8 8 | | 1 = repacking |
| | | Note: The case of non-persistent should not be repacked. |
| If (Repacking Flag == 0) { | | |
| Duration | variable | Duration in slots. OFDMA Frame duration dependant |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame 10 bits – 20 ms frame |
| Slot Offset | variable | 7 bits – 2.5 ms frame |
| Slot Offset | variable | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| If (Persistent Flag == 1) { | | |
| Allocation Period (ap) | 5 | Period of the persistent allocation is this field value plus 1 |
| | | (unit is frame) |
| Number of ACID | 3 | Number of HARQ channels associated with this persistent |
| (N_ACID) | | assignment is this field value plus 1 |
| MAP NACK Channel | 6 | Index to a shared MAP NACK channel within the Fast |
| Index MAP ACK Channel Index | 6 | Feedback region Index to a MAP ACK channel within the Fast Feedback |
| WAT ACK Chamlet index | U | region |
| } | | region |
| Boosting | 3 | 0b000: Normal (not boosted) |
| 8 | | 0b001: +6dB |
| | | 0b010: -6dB |
| | | 0b011: +9dB |
| | | 0b100: +3dB |
| | | 0b101: -3dB |
| | | 0b110: -9dB 0b111: -12dB; |
| | | 00111. –12dB, |
| | | Note that if the Persistent flag is set, the boosting value |
| | | applies to the first allocation instance only; [Mo-Han please |
| | | elaborate as to what you would like say here] |
| Sub-burst DIUC indicator | 1 | If Sub-Burst DIUC Indicator is 1, it indicates that DIUC is |
| | | explicitly assigned for this subburst. Otherwise, this |
| | | subburst will use the same DIUC as the previous subburst. |
| If (Sub-hunst DILIC | | If j is 0 then this indicator shall be 1. |
| If (Sub-burst DIUC 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 | - 1 - CVD |
| AI_SN | 1 | Initial AI_SN for each ACID |
| ACK disable | 1 | When ACK Disable == 1, the allocated subburst does not |

| | 1 | |
|----------------------------|----------|--|
| | | require an ACK to be transmitted by the |
| | | SS in the ACKCH Region (see 8.4.5.4.25). In this case, no |
| | | ACK channel is allocated for the subburst in the ACKCH |
| | | Region. For the burst, BS shall not perform HARQ |
| | | retransmission and MS shall ignore ACID, AI_SN and |
| | | SPID, which shall be set to 0 by BS if they exist. The CRC |
| | | shall be appended at the end of each sub-burst regardless of |
| | | the ACK disable bit. |
| If (ACK disable== 0) { | | |
| ACK channel | 8 | Indicates the ACK channel to be used for this sequence of |
| | | sub-bursts as defined in 8.4.5.4.25. |
| } | | |
| Dedicated DL control | 2 | LSB #0 indicates inclusion of CQI control |
| Indicator | | LSB #1 indicates inclusion of Dedicated DL Control IE. |
| If (LSB #0 of dedicated DL | | ESD #1 indicates inclusion of Dedicated DE Control IE. |
| control indicator ==1){ | | |
| Duration (d) | 4 | A CQI feedback is transmitted on the CQI channels indexed |
| Duration (u) | | 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 |
| | | |
| If (Duration !=0b0000){ | 1 | should report until the BS command for the MS to stop. |
| Allocation index | 6 | I. 1. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. |
| Allocation index | 0 | Index to the channel in a frame the CQI report should be |
| D 11() | 2 | transmitted by the SS. |
| Period (p) | 3 | A CQI feedback is transmitted on the CQI channels indexed |
| | | by the (CQI Channel Index) by the SS in every 2 ^p frames. |
| Frame offset | 3 | The MS starts reporting at the frame of which the number |
| | | has the same 3 LSB as the specified frame offset. If the |
| | | current frame is specified, the MS should start reporting in |
| | | eight frames. |
| } | | |
| } | | |
| If (LSB #1 of dedicated DL | | |
| control indicator ==1){ | | |
| Dedicated DL control IE () | variabl | |
| | e | |
| } | | |
| } | | |
| If (Repacking Flag == 1) { | | |
| Delta duration | variable | Difference of duration between previous allocation and |
| | | newly allocation (reallocation) in slots. OFDMA Frame |
| | | duration dependant |
| | | 7 bits -2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| | | |
| | | This field provides information about both reallocation and |
| | | repacking. In case that RCID of a MS involved in the |
| | | persistent allocation is equal to a value of RCID_IE, the MS |
| | | shall update allocation information from this value. |
| | | Otherwise, the MS shall interpret this field as repacking. |
| | | Otherwise, the was shall interpret this field as repacking. |
| | | - 1 MSB: 0 == extension, 1 == shrink |
| | | - Other LSBs: the difference of duration between new |
| | | allocation and previous allocation. It can also represent the |
| | 1 | amount of repacking. In case of extension case, the slot |
| | | |

| | | offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration. |
|-------------------------------------|--------------|--|
| Slot Offset | variable | 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field. |
| Sub-burst DIUC indicator | 1 | If Sub-Burst DIUC Indicator is 1, it indicates that DIUC is explicitly assigned for this subburst. Otherwise, this subburst will use the same DIUC as the previous subburst. If j is 0 then this indicator shall be 1. |
| If (Sub-burst DIUC indicator ==1) { | | |
| DIUC | 4 | - |
| Repetition coding indication | 2 | 0b00: No Repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used |
| } | | |
| } | | |
| } | | |
| } | | |
| Padding | 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 of sub bursts; $j++)$ { | | |
| RCID_IE() | variable | |
| Allocation Flag | 1 | 0 = de-allocate |
| | | 1 = allocate |
| If (Allocation Flag == 0) { | | |
| Repacking Flag | 1 | 0 = no repacking |
| | | 1 = repacking |
| if (Repacking Flag ==1) { | | |
| ${f N_{EP}}$ | 4 | |
| N_{SCH} | 4 | |
| Slot Offset | variable | Indicates the start of this persistent allocation in OFDMA |
| | | slots, with respect to the lowest numbered OFDM symbol |
| | | and the lowest numbered subchannel in the HARQ |
| | | region. |
| | | OFDMA Frame duration dependant |
| | | 7 bits – 2.5 ms frame |

| | | 8 bits – 5 ms frame |
|-----------------------------|----------|--|
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| } | | |
| } | | |
| If (Allocation Flag == 1) { | | |
| Persistent Flag | 1 | 0 = non-persistent |
| | | 1 = persistent |
| Repacking Flag | 1 | 0 = no repacking |
| | | 1 = repacking |
| Te (D. 1: Fl. 0) (| | Note: The case of non-persistent should not be repacked. |
| If (Repacking Flag == 0) { | 4 | |
| N _{EP} | 4 4 | |
| N _{SCH} | | I I' a di a canada |
| Slot Offset | variable | Indicates the start of this persistent allocation in OFDMA |
| | | slots, with respect to the lowest numbered OFDM symbol |
| | | and the lowest numbered subchannel in the HARQ |
| | | region. |
| | | OFDMA Frame duration dependant 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| If (Persistent Flag == 1) { | | 10 bits – 20 his frame |
| Allocation Period (ap) | 5 | Period of the persistent allocation is this field value plus 1 |
| Anocation 1 criod (ap) | 3 | (unit is frame) |
| Number of ACID (N_ACID) | 3 | Number of HARQ channels associated with this |
| Number of ACID (N_ACID) | 3 | persistent assignment is this field value plus 1 |
| MAP NACK Channel Index | 6 | Index to a shared MAP NACK channel within the Fast |
| | o o | 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 | - List LAT COLC |
| 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, |

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

| | | be reduced by the difference of duration. |
|-------------|----------|--|
| Slot Offset | variable | 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field. |
| } | | |
| } | | |
| D 11: | | D 11 |
| Padding | variable | Padding to nibble; shall be set to 0. |
| radding } | variabie | radding to modie; snan de set to 0. |

Table YYY – Persistent DL HARQ IR CC Subburst IE format

| Syntax | Size | Notes |
|--|----------------------|---|
| O J ALCELIA | (bits) | 110000 |
| Persistent_DL_HARQ_IR_CC_Sub-Burst_IE() { | (DIG) | |
| 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 Slot Offset | 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 Indicates the start of this persistent allocation in OFDMA slots, |
| Siot Offset | variable | 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 |
| 2 64 604044 | | 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 |
| | | 0b110: -9db 0b111: -12dB; |
| | | 00111. –12ub, |
| | | Note that if the Persistent flag is set, the boosting value applies |
| | | to the first allocation instance only; [Mo-Han please elaborate |
| | | as to what you would like say here] |
| Sub-burst DIUC indicator | 1 | If Sub-Burst DIUC Indicator is 1, it indicates that DIUC is |
| | | explicitly assigned for this subburst. Otherwise, this subburst |
| | | will use the same DIUC as the previous subburst. If j is 0 then |
| | | this indicator shall be 1. |
| If (Sub-burst DIUC indicator==1) { | | |
| DIUC | 4 | - |
| Repetition coding indication | 2 | 0b00: No Repetition coding |
| | | 0b01: Repetition coding of 2 used |
| | | 0b10: Repetition coding of 4 used |
| 1 | | 0b11: Repetition coding of 6 used |
| ACID | 4 | |
| ACID AI_SN | 1 | Initial AI_SN for each ACID |
| SPID | 2 | |
| ACK disable | 1 | When ACK Disable == 1, the allocated subburst does not |
| | | require an ACK to be transmitted by the |
| | | SS in the ACKCH Region (see 8.4.5.4.25). In this case, no |
| | | ACK channel is allocated for the subburst in the ACKCH |
| | | Region. For the burst, BS shall not perform HARQ |
| | | retransmission and MS shall ignore ACID, AI_SN and SPID, |
| | | which shall be set to 0 by BS if they exist. The CRC shall be |
| | | appended at the end of each sub-burst regardless of the ACK |
| TC (A CVZ II 11 O) (| | disable bit. |
| If (ACK disable== 0) { | | T I' at ACIT 1 to 1 to 2 |
| ACK channel | 8 | Indicates the ACK channel to be used for this sequence of subbursts as defined in 8.4.5.4.25. |
| 1 | 1 | Duists as defined in 0.4.3.4.23. |
| } | | |

| Dedicated DL control Indicator | 2 | LSB #0 indicates inclusion of CQI control |
|--|----------|--|
| Dedicated DL control indicator | Δ | LSB #0 indicates inclusion of CQI control LSB #1 indicates inclusion of Dedicated DL Control IE. |
| If (LSB #0 of dedicated DL control indicator ==1){ | | |
| Duration (d) | 4 | A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS for 2(d–1) frames. If d is 0b0000, deallocates all CQI feedback when the current ACID is completed successfully. If d is 0b1111, the MS should report until the BS command for the MS to stop. |
| If (Duration !=0b0000){ | | |
| Allocation index | 6 | Index to the channel in a frame the CQI report should be transmitted by the SS. |
| Period (p) | 3 | A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS in every 2 ^p frames. |
| Frame offset | 3 | The MS starts reporting at the frame of which the number has the same 3 LSB as the specified frame offset. If the current frame is specified, the MS should start reporting in eight frames. |
| } | | |
| If (LSB #1 of dedicated DL control | | |
| indicator ==1){ | . 11 | |
| Dedicated DL control IE () | variabl | |
| } | e | |
| } | | |
| If (Repacking Flag == 1) { | | |
| Delta duration | variable | Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration. |
| Slot Offset | variable | 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding |

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

Table YYY – Persistent MIMO DL Chase HARQ Subburst IE format

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

| If (MU Indicator == 0) { | | |
|---|---------------|---|
| If (Allocation flag == 0) { | | |
| RCID | variable | |
| If (Repacking Flag== 1) | 7 617 1616 16 | |
| 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 (-114' P) 1) (| 1 | |
| If (allocation Flag == 1) { | | |
| If (Repacking Flag == 0){ RCID | | |
| Persistent flag | variable 1 | |
| rersistent nag | 1 | 0 = non-persistent allocation 1 = persistent allocation |
| Duration | variable | See definition above in this IE |
| Slot Offset | variable | See definition above in this IE |
| Dedicated MIMO Control Indicator | 1 | |
| ACK Disable | 1 | When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the SS in the ACKCH Region (see 8.4.5.4.24). In this case, no ACK channel is allocated for the subburst in the ACKCH Region. For the burst, BS shall not perform HARQ retransmission and MS shall ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each subburst regardless of the ACK disable bit. |
| If (persistent flag ==1){ | | |
| Allocation Period | 5 | Period of the persistent allocation is this field value plus 1 (unit is frame) |
| Number of ACID (N_ACID) | 3 | Number of HARQ channels associated with this persistent assignment is this field value plus 1 |
| MAP ACK Channel Index | 6 | Index to a MAP ACK channel within the Fast Feedback region |
| MAP NACK Channel Index | 6 | Index to a shared MAP NACK channel within the Fast Feedback region |
| } | | |
| For (i=0; i <n_layers;i++) 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 |
| 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 |
|--|----------|---|
| } | 1 | Initial Fit_DIVIOLEMENT FOR |
| } | | |
| If (Repacking Flag == 1) { | | |
| RCID IE () | variable | |
| DIUC | 4 | |
| Repetition | 2 | 0b00: No Repetition coding |
| _ | | 0b01: Repetition coding of 2 used |
| | | 0b10: Repetition coding of 4 used |
| | | 0b11: Repetition coding of 6 used |
| Delta duration | variable | Difference of duration between previous allocation and |
| | | newly allocation (reallocation) in slots. OFDMA Frame |
| | | duration dependant |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame 10 bits – 20 ms frame |
| | | 10 bits – 20 ms frame |
| | | This field provides information about both reallocation |
| | | and repacking. In case that RCID of a MS involved in |
| | | the persistent allocation is equal to a value of RCID_IE, |
| | | the MS shall update allocation information from this |
| | | value. Otherwise, the MS shall interpret this field as |
| | | repacking. |
| | | |
| | | - 1 MSB: 0 == extension, 1 == shrink |
| | | - Other LSBs: the difference of duration between new |
| | | allocation and previous allocation. It can also represent |
| | | the amount of repacking. In case of extension case, the |
| | | slot offset of the MS to be repacked will be increased by |
| | | the difference of duration. Otherwise, the slot offset will |
| | | be reduced by the difference of duration. |
| CI + Oee + | . 11 | 71: 25 6 |
| Slot Offset | variable | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame 10 bits – 20 ms frame |
| | | This value indicates the first slot index of the MS to be |
| | | reallocated. This MS's RCID is equal to the value of |
| | | RCID_IE. If one's slot offset is higher than this value, |
| | | the corresponding MSs shall perform repacking using |
| | | "Delta Duration" field. |
| } | | |
| } | | |
| If (MU Indicator == 1) { | | |
| If (Dedicated MIMO control indicator == 1) | | |
| { | | |
| Dedicated MIMO DL Control IE () | variable | |
| Layer relevance bit map | 4 | 4 bits bit map indicating if layer processing should be |
| Layer relevance bit map | 4 | skipped. The bit position indicates the layer. The bit |
| | | value: |
| | | 0 = skip the layer; |
| | | 1 = process the layer |
| For (i=0; I <n_layers; i++)="" th="" {<=""><th></th><th>1 process the tayer</th></n_layers;> | | 1 process the tayer |
| If (Allocation flag == 0) { | | De-allocate |
| RCID IE () | variable | De unocuie |
| KOD IL () | ranabic | L |

| IC (D. 11 El. 1) (| 1 | |
|-----------------------------|----------|--|
| If (Repacking Flag == 1) { | . 11 | |
| 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 | |
| NON Chamier | 0 | |
| ACID | 4 | |
| | 1 | |
| 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 | |
| | variable | |
| | 4 | |
| DIUC | | 0b00: No Repetition coding |
| | 4 | 0b00: No Repetition coding 0b01: Repetition coding of 2 used |
| DIUC | 4 | 0b01: Repetition coding of 2 used |
| DIUC | 4 | 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used |
| DIUC Repetition | 2 | 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used |
| DIUC | 4 | 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 |
| DIUC 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 |
| DIUC 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 |
| DIUC 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 |
| DIUC 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 |
| DIUC 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 9 bits - 10 ms frame |
| DIUC 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 |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame This field provides information about both reallocation |
| DIUC 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 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 |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame This field provides information about both reallocation |
| DIUC 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 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 |
| DIUC 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 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, |
| DIUC 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 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 |
| DIUC 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 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 |
| DIUC 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 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. |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will |
| DIUC 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 9 bits - 10 ms frame 10 bits - 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by |

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

 $Table\ YYY-Persistent\ MIMO\ DL\ IR\ HARQ\ Subburst\ IE\ format$

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

| N_{SCH} | 4 | |
|---|----------|--|
| Slot Offset | variable | Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame |
| } | | |
| } If (allocation Flag == 1) { If (Repacking Flag == 0) { | | |
| RCID | variable | |
| Persistent flag | 1 | 0 = non-persistent allocation 1 = persistent allocation |
| N _{EP} | variable | See definition above in this IE |
| N _{SCH} Slot Offset | variable | See definition above in this IE |
| | | |
| Dedicated MIMO Control Indicator 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 |
| If (persistent flag ==1){ | | each subburst regardless of the ACK disable bit. |
| 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++)> | | |
| $N_{\rm EP}$ | 4 | |
| N _{SCH} | 4 | |
| If (ACK Disable == 0) { ACK Channel | 8 | Indicates the ACK channel to be used for this sequence of sub-bursts as defined in 8.4.5.4.25. |
| } | | |
| SPID | 2 | |
| ACID | 4 | 1 ACID |
| AI_SN | 1 | Initial AI_SN for each ACID |
| If (Repacking Flag == 1){ | | |
| RCID IE () | variable | |
| N _{EP} | 4 | |
| Delta Duration | variable | Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant |

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

| 1 | | |
|--|----------|---|
| SPID | 2 | |
| ACID | 4 | |
| ALSN | 1 | |
| If (Persistent Flag == 1) { | 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 |
| | 6 | See definition above in this IE See definition above in this IE |
| MAP ACK Channel Index MAP NACK Channel Index | - | |
| MAP NACK Channel Index | 6 | See definition above in this IE |
| } | | |
| } IC(D 1: El 1)(| | |
| If (Repacking Flag == 1) { | . 11 | |
| RCID IE () | variable | |
| N _{EP} | 4 | 11 d 1 d 1 |
| Delta Duration | variable | Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration. |
| Slot Offset | variable | 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field. |
| } | | |
| \ \ | | |
| Padding | variable | Padding to nibble; shall be set to zero |
| 1 audilig | variable | 1 adding to modic, shall be set to zero |
| } | | |

| Syntax | Size (bits) | Notes |
|---|----------------|---|
| Persistent_MIMO_DL_IR_HARQ_CC_Sub-Burst_IE() { | (2263) | |
| 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>1 – packing</td></number> | | 1 – packing |
| MU indicator | 1 | Indicates whether this DL burst is intended for multiple MS 0 = Single MS 1 = multiple MS |
| Allocation Flag | 1 | 1 = allocate 0 = de-allocate |
| Dedicated MIMO Control Indicator | 1 | 0 == MS shall use the stored Dedicated MIMO DL Control information from the last burst allocation where this information was included. 1 = MS uses the Dedicated MIMO DL control information is this IE |
| If (Allocation Flag == 1) { | | |
| Boosting | 3 | 0b000: Normal (not boosted) 0b001: +6dB 0b010: -6dB 0b011: +9dB 0b100: +3dB 0b101: -3dB 0b110: -9dB 0b111: -12dB; Note that if the Persistent flag is set, the boosting value applies to the first allocation instance only. |
| } | | |
| If (MU Indicator == 0) { | | |
| If (Allocation flag == 0) { | | |
| RCID | variable | |
| If (Repacking Flag== 1) Duration | variable | Duration in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame |
| Slot Offset | variable | Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame |
| } | | |
| } | | |
| If (allocation Flag == 1) { | | |
| If (Repacking Flag == 0) { | | |
| RCID | variable | |
| Persistent flag | 1 | 0 = non-persistent allocation |

| | | 1 = persistent allocation |
|--|----------|---|
| Duration | variable | See definition above in this IE |
| Slot Offset | variable | See definition above in this IE |
| Dedicated MIMO Control Indicator | 1 | |
| ACK Disable | 1 | When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the SS in the ACKCH Region (see 8.4.5.4.24). In this case, no ACK channel is allocated for the subburst in the ACKCH Region. For the burst, BS shall not perform HARQ retransmission and MS shall ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each subburst regardless of the ACK disable bit. |
| If (persistent flag ==1){ | | |
| Allocation Period | 5 | Period of the persistent allocation is this field value plus 1 (unit is frame) |
| Number of ACID (N_ACID) | 3 | Number of HARQ channels associated with this persistent assignment is this field value plus 1 |
| MAP ACK Channel Index | 6 | Index to a MAP ACK channel within the Fast Feedback region |
| MAP NACK Channel Index | 6 | Index to a shared MAP NACK channel within the Fast Feedback region |
| } F (:0:3) | | |
| For (i=0; i <n_layers;i++) th="" {<=""><th>A</th><th></th></n_layers;i++)> | A | |
| Repetition | 2 | 0b00: No Repetition coding |
| | 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 | |
| ACID AI_SN | 1 | Initial AI_SN for each ACID |
| SPID | 2 | Illitidi AI_SN 101 each ACID |
| } | 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 |
| } D1(-1 | | Diff. C1 of 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, |

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

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

Table YYY – Persistent MIMO DL STC HARQ Subburst IE format

| Syntax Size Notes |
|-------------------|
|-------------------|

| | (1.4.) | |
|--|-------------|---|
| | (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 | , = 0 state 0 |
| RCID_IE () | variable | |
| If (Repacking Flag ==1) { | 7 337 337 3 | // repacking is allowed |
| Duration | | 77 Topucking is uno wed |
| Slot Offset | | |
| } | | |
| } | | |
| if (allocation flag ==1) | | // allocation |
| If (Repacking Flag == 0) { | | // dilocution |
| RCID IE () | variable | |
| Persistent Flag | 1 | |
| If (Persistent Flag == 1) { | 1 | |
| Allocation period (ap) | | |
| MS ID | | |
| | | |
| Allocation ID | | |
| MAP NACK Channel Index | 6 | |
| MAP ACK Channel Index | 6 | |
| <u> </u> | _ | |
| Boosting | 3 | |
| Tx count | 2 | |
| Duration | variable | |
| Sub-burst offset indication | 1 | Indicates the inclusion of sub-burst offset |
| If (Sub-burst offset indication ==1) { | | |
| Sub-burst offset | 8 | Offset in slots with respect to the previous sub-burst defined in this data region. If this is the first sub-burst within the data region, this offset is with respect to slot 0 of the data region. |
| } | | |
| ACK disable | 1 | |
| if (Tx count $== 0$) { | | |
| Dedicated MIMO control indicator | 1 | |
| If (Dedicated MIMO control indictor | | |
| ==1) { | | |
| DIUC | 4 | |
| Repetition Coding Indicator | 2 | |
| } | | |
| if (ACK disable == 0) { | | |
| ACID | 4 | |
| } | | |
| } | | |
| If (Repacking Flag == 1){ | | |
| RCID_IE () | variable | |
| DIUC | 4 | |
| Repetition Coding Indicator | 2 | |
| Delta duration | variable | Difference of duration between previous allocation and |
| Dom daration | , an anote | newly allocation (reallocation) in slots. OFDMA |

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

[Add new section to 8.4.5.4.29]

8.4.5.4.29 HARQ UL MAP Persistent Allocation IE

Table YYY - Persistent HARQ UL MAP IE

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

| While (data remains) { | _ | |
|--|---|---|
| Mode | 3 | Indicates the mode of this IE: |
| | | 0b000: Persistent Chase HARQ |
| | | 0b001: Persistent Incremental redundancy |
| | | HARQ |
| | | for CTC |
| | | 0b010: Persistent Incremental redundancy |
| | | HARQ |
| | | for convolutional code |
| | | 0b011: Persistent MIMO Chase HARQ |
| | | 0b100: Persistent MIMO IR HARQ |
| | | 0b101: Persistent MIMO IR HARQ for convolutional code |
| | | 0b110: Persistent MIMO STC HARQ |
| | | 0b111: Reserved |
| Group ID | 4 | Group identifier for this Persistent IE |
| Persistent Change Counter | 4 | Persistent Change Counter. PCC value is |
| | | increased by one if the persistent IE includes |
| | | one or more changes in the corresponding |
| | | group persistent allocation every allocation |
| | | period. If there is no change, the PCC value |
| | | does not increase. |
| | | If a MS's PCC is not equal to this value, the |
| | | MS shall transmit a MAP NACK signal in a relevant MAP NACK channel. |
| Allocation Start Indication | 1 | 0: No allocation start information |
| Anocation Start Indication | 1 | 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 |
| D | 1 | HARQ UL MAP IE |
| Reserved | 1 | Shall be set to zero |
| N sub-bursts | 4 | Number of sub-bursts in this Persistent |
| TI DEL DEL DEL | | HARQ UL MAP IE is this field value plus 1. |
| For (i=0;i <number i++)="" of="" sub-burst;="" th="" {<=""><th></th><th></th></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 | | |
| IE () | | |
| } else if (mode == 101) { | | |
| Persistent MIMO UL IR HARQ for CC | | |

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

Table YYY - Persistent UL HARQ Chase Subburst IE format

| Syntax Table YYY - Persister | Size (bits) | Notes |
|---|-------------|--|
| Persistent UL HARQ Chase Sub-Burst IE { | Size (Sits) | 110005 |
| RCID_IE() | variable | |
| Resource Shifting Indicator | 1 | 0 = no resource shifting |
| Resource Simulag Indicator | 1 | 1 = resource shifting |
| Allocation Flag | 1 | 1 = allocate |
| Amocation Flag | 1 | 0 = de-allocate |
| If (Allocation Flag == 0) { | | 0 - de difocute |
| if (Resource Shifting Indicator ==1) { | | |
| Duration | Variable | Duration in slots. OFDMA Frame duration |
| Duration | Variable | dependant |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| S1-4 OFF4 | X7: -1-1- | |
| Slot Offset | Variable | Indicates the start of this persistent allocation in |
| | | OFDMA slots, with respect to the start of the |
| | | UL subframe if an allocation start indication is |
| | | not included in this IE and with respect to |
| | | OFDM symbol offset and subchannel offset if an |
| | | allocation start indication is included in this IE |
| | | OFDMA Frame duration dependant |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| } | | |
| } | | |
| If (Allocation Flag == 1) { | | |
| If (Resource Shifting Indicator == 0) { | | |
| Persistent Flag | 1 | 0 = non-persistent |
| | | 1 = persistent |
| Duration | variable | Duration in slots. OFDMA Frame duration |
| | | dependant |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| Slot Offset | variable | Indicates the start of this persistent allocation in |
| | | OFDMA slots, with respect to the start of the |
| | | UL subframe if an allocation start indication is |
| | | not included in this IE and with respect to |
| | | OFDM symbol offset and subchannel offset if an |

| | | allocation start indication is included in this IE |
|---|----------|--|
| | | 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame |
| If (Persistent Flag == 1) { | | |
| Allocation Period (ap) | 5 | Period of the persistent allocation is this field value plus 1 (unit is frame) |
| Number of ACID (N_ACID) | 3 | Number of HARQ channels associated with this persistent assignment is this field value plus 1 |
| MAP NACK Channel Index | 6 | Index to a shared MAP NACK channel within the Fast Feedback region |
| MAP ACK Channel Index | 6 | Index to a MAP ACK channel within the Fast Feedback region |
| } | | |
| Dedicated UL Control Indicator | 1 | - |
| If (Dedicated UL Control Indicator ==1) { | | |
| Dedicated UL Control IE () | variable | |
| } | - | - |
| UIUC | 4 | 0100 M D 33 |
| Repetition Coding Indication | 1 | 0b00: No Repetition coding |
| | | 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used |
| | | 0b11: Repetition coding of 4 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 (Decorate Chifting Indicates 1) (| <u> </u> | |
| If (Resource Shifting Indicator == 1) { Delta duration | variable | Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame |
| | | This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. |

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

Table YYY - Persistent UL HARQ IR CTC Subburst IE format

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

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

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

Table YYY - Persistent UL HARQ IR CC Subburst IE format

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

| | 1 | |
|--|---------------|--|
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| CV + O.00 | ** * 1 1 | 10 bits – 20 ms frame |
| Slot Offset | Variable | Indicates the start of this persistent allocation in OFDMA |
| | | slots, with respect to the start of the UL subframe if an |
| | | allocation start indication is not included in this IE and |
| | | with respect to OFDM symbol offset and subchannel |
| | | offset if an allocation start indication is included in this IE |
| | | OFDMA Frame duration dependant |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| } | | |
| | | |
| If (Allocation Flag == 1) { If (Passures shifting indicator == 0) { | | |
| If (Resource shifting indicator == 0) { | 1 | 0 – non porsistant |
| Persistent Flag | 1 | 0 = non-persistent 1 = persistent |
| Duration | variable | Duration in slots. OFDMA Frame duration dependant |
| Durauon | variable | 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 |
| Siot Offset | variable | slots, with respect to the start of the UL subframe if an |
| | | allocation start indication is not included in this IE and |
| | | with respect to OFDM symbol offset and subchannel |
| | | offset if an allocation start indication is included in this IE |
| | | |
| | | |
| | | 7 bits -2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| If (Persistent Flag == 1) { | - | |
| Allocation Period (ap) | 5 | Period of the persistent allocation is this field value plus 1 (unit is frame) |
| Number of ACID (N_ACID) | 3 | Number of HARQ channels associated with this persistent |
| Number of ACID (N_ACID) | | 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 |
| D. W. 1377 G. 1177 | 4 | |
| Dedicated UL Control Indicator | 1 | - |
| If (Dedicated UL Control Indicator | | |
| ==1) { Dedicated UL Control IE () | variable | |
| Dedicated OL Control IE () | variable - | _ |
| UIUC | 4 | - |
| Repetition Coding Indication | 1 | 0b00: No Repetition coding |
| Repetition County mulcation | 1 | 0b01: Repetition coding of 2 used |
| | | 0b10: Repetition coding of 2 used |
| | | 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used |
| SPID | 4 | - |
| DIID | 1 7 | 1 |

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

Table YYY – Persistent MIMO UL Chase HARQ Subburst IE format

| tax | Size Notes | |
|-----|------------|--|
|-----|------------|--|

| | (bits) | |
|--|-----------|---|
| Persistent_MIMO_UL_Chase_HARQ_Sub-Burst_IE() | (12 2.12) | |
| { | | |
| Resource Shifting Indicator | 1 | 0 = no packing |
| MU Indicator | 1 | 1 = packing Indicates whether this UL burst is intended for multiple |
| WIO indicator | 1 | MS |
| | | 0 = Single MS |
| | | 1 = multiple MS |
| Allocation Flag | 1 | 1 = allocate |
| | | 0 = de-allocate |
| Dedicated MIMO UL Control Indicator | 1 | 0 == MS shall use the stored Dedicated MIMO UL |
| | | Control information from the last burst allocation where this information was included. |
| | | 1 = MS uses the Dedicated MIMO UL control |
| | | information is this IE |
| If (MU Indicator == 0) { | | |
| If (Allocation flag == 0) { | | |
| RCID IE() | variable | |
| If (Resource Shifting Indicator== 1) | | |
| Duration | variable | Duration in slots. OFDMA Frame duration dependant |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| Slot Offset | variable | Indicates the start of this persistent allocation in OFDMA |
| Side Office | rantaste | 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 |
| } | | 10 otto 20 mo mune |
| } | | |
| If (Allocation Flag == 1) { | | |
| If(Resource shifting indicator == 0) { | | |
| RCID IE() | variable | |
| If (Dedicated MIMO UL Control | | |
| indicator == 1) { Dedicated MIMO UL Control | iahla | |
| IE () | variable | |
| } | | |
| Persistent Flag | 1 | 0 = non-persistent allocation |
| | | 1 = persistent allocation |
| Duration | variable | See definition above in this IE |
| Slot Offset | variable | See definition above in this IE |
| ACK Disable | 1 | When ACK Disable == 1, the allocated subburst does |
| | | not require an ACK to be transmitted by the BS in the |
| | | HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no bit position is allocated for the subburst in the HARQ |
| | | ACK BITMAP. For the burst, MS shall not perform |
| | | HARQ retransmission and ignore ACID, AI_SN and |
| | | SPID, which shall be set to 0 by BS if they exist. The |
| | | CRC shall be appended at the end of each sub-burst |
| | | regardless of the ACK disable bit. |

| If (persistent flag ==1){ | | |
|---|----------|--|
| Allocation Period | 5 | Period of the persistent allocation is this field value plus 1 (unit is frame) |
| Number of ACID (N_ACID) | 3 | Number of HARQ channels associated with this persistent assignment is this field value plus 1 |
| MAP ACK Channel Index | 6 | Index to a MAP ACK channel within the Fast Feedback region |
| MAP NACK Channel Index | 6 | Index to a shared MAP NACK channel within the Fast Feedback region |
| } | | |
| For (i=0; i <n_layers;i++) 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 |
| If (ACK Disable == 0) { | | 0b11: Repetition coding of 6 used |
| ACK Channel | 8 | Indicates the ACK channel to be used for this sequence |
| ACK Chaintei | 8 | of sub-bursts as defined in 8.4.5.4.25. |
| ACID | 4 | |
| AI_SN | 1 | Initial AI_SN for each ACID |
| } | 1 | Indui / II_SI (for each / ICID |
| } | | |
| } | | |
| If (Resource Shifting Indicator == 1) { | | |
| RCID IE() | variable | |
| Delta duration | variable | Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration. |
| Slot Offset | variable | 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, |

| | 1 | the corresponding MCs shall perform repealing using |
|--|----------|---|
| | | the corresponding MSs shall perform repacking using "Delta Duration" field. |
| For (i=0; i <n_layers;i++) th="" {<=""><th></th><th>Delta Duration Tield.</th></n_layers;i++)> | | Delta Duration Tield. |
| UIUC | 4 | |
| Repetition Coding Indication | 2 | 0b00: No Repetition coding |
| Repetition Coung Indication | 2 | 0b01: Repetition coding of 2 used |
| | | 0b10: Repetition coding of 4 used |
| | | 0b11: Repetition coding of 6 used |
| } | | g |
| } | | |
| } | | |
| If (MU Indicator == 1) { | | |
| If (Dedicated MIMO UL Control indicator | | |
| == 1) { | | |
| Dedicated MIMO UL Control IE () | variable | |
| } | | |
| Layer Relevance Bitmap | 4 | 4 bit bitmap indicating if layer processing should be |
| | | skipped in the subsequent 'for loop'. The bit position |
| | | indicates the layer. The bit value: |
| | | 0 = skip the layer; |
| | | 1 = process the layer |
| For (i=0; i <n_layers; i++)="" th="" {<=""><th></th><th></th></n_layers;> | | |
| If (Allocation flag == 0) { | | De-allocate |
| RCID IE() | variable | |
| If (Resource Shifting Indicator == 1) | | |
| (II + O 00 + | | |
| Slot Offset | variable | See definition above in this IE |
| Duration | variable | See definition above in this IE |
| } | | |
| If (Allegation Floor—1) (| | |
| If (Allocation Flag == 1) { If (Resource shifting indicator == 0){ | | |
| RCID IE() | variable | |
| Persistent flag | 1 | |
| Slot Offset | variable | See definition above in this IE |
| Duration | variable | See definition above in this IE |
| ACK Disable | 1 | See definition above in this IE |
| UIUC | 4 | |
| Repetition Coding Indication | 2 | See definition above in this IE |
| If (ACK Disable == 0) { | | |
| ACK Channel | 8 | |
| } | | |
| ACID | 4 | |
| AI_SN | 1 | |
| If (Persistent Flag == 1) { | | |
| Allocation Period | 5 | See definition above in this IE |
| Number of ACID (N_ACID) | 3 | See definition above in this IE |
| MAP ACK Channel Index | 6 | See definition above in this IE |
| MAP NACK Channel Index | 6 | See definition above in this IE |
| } | | |
| } | | |
| If (Resource Shifting Indicator == 1) { | | |
| RCID IE() | variable | |
| Delta duration | variable | Difference of duration between previous allocation and |
| | | newly allocation (reallocation) in slots. OFDMA Frame |
| | | duration dependant |

| | | 7 bits – 2.5 ms frame 8 bits – 5 ms frame |
|------------------------------|----------|---|
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| | | This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. |
| | | - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration. |
| Slot Offset | variable | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | | 10 bits – 20 ms frame |
| | | This value indicates the first slot index of the MS to be |
| | | reallocated. This MS's RCID is equal to the value of |
| | | RCID_IE. If one's slot offset is higher than this value, |
| | | the corresponding MSs shall perform repacking using |
| VIII.G | 4 | "Delta Duration" field. |
| UIUC | 4 | I OLOO N. D. 122 |
| Repetition Coding Indication | 2 | 0b00: No Repetition coding |
| | | 0b01: Repetition coding of 2 used |
| | | 0b10: Repetition coding of 4 used |
| 1 | | 0b11: Repetition coding of 6 used |
| } | | |
| } | | |
| } | | |
| Do differen | 11 | Dadding to within their to |
| 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 |

| | | 1 = MS uses the Dedicated MIMO UL control |
|---|----------|--|
| If (MU Indicator == 0) { | | information is this IE |
| If (Allocation flag == 0) { | | |
| RCID IE () | variable | |
| If (Resource Shifting Indicator== 1) | variable | |
| N _{SCH} | 4 | |
| Slot Offset | variable | Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame |
| } | | |
| If (Allocation Flag == 1) { | | |
| If (Resource shifting indicator == 0) { | | |
| RCID IE () | variable | |
| If (Dedicated MIMO UL Control | rantable | |
| indicator == 1) { | | |
| Dedicated MIMO UL Control IE () | variable | |
| } | | |
| Persistent Flag | 1 | 0 = non-persistent allocation 1 = persistent allocation |
| N_{SCH} | 4 | |
| SPID | 2 | |
| N _{EP} | 4 | |
| Slot Offset | variable | See definition above in this IE |
| ACK Disable | 1 | When ACK Disable == 1, the allocated subburst does not require an ACK to be transmitted by the BS in the HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no bit position is allocated for the subburst in the HARQ ACK BITMAP. For the burst, MS shall not perform HARQ retransmission and ignore ACID, AI_SN and SPID, which shall be set to 0 by BS if they exist. The CRC shall be appended at the end of each sub-burst regardless of the ACK disable bit. |
| If (persistent flag ==1){ | | Deviced of the magnitude allogation is this field and |
| 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 |

| | | 01-10. D |
|--|----------|--|
| | | 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used |
| If (ACK Disable == 0) { | | Obtr. Repetition coding of 6 used |
| ACK Channel | 8 | Indicates the ACK channel to be used for this sequence |
| ACIX Channel | | of sub-bursts as defined in 8.4.5.4.25. |
| } | + | of sub bursts as defined in 6.4.5.4.25. |
| ACID | 4 | |
| AI_SN | 1 | Initial AI_SN for each ACID |
| } | 1 | Initial III_SI\ISI Cach IICIS |
| If (Resource Shifting Indicator == 1) { | | |
| RCID IE() | variable | |
| N _{EP} | 4 | |
| Delta Duration | 4 | Difference of duration between previous allocation and newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This field provides information about both reallocation and repacking. In case that RCID of a MS involved in the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this value. Otherwise, the MS shall interpret this field as repacking. - 1 MSB: 0 == extension, 1 == shrink - Other LSBs: the difference of duration between new allocation and previous allocation. It can also represent the amount of repacking. In case of extension case, the slot offset of the MS to be repacked will be increased by the difference of duration. Otherwise, the slot offset will be reduced by the difference of duration. |
| Slot Offset | variable | 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame This value indicates the first slot index of the MS to be reallocated. This MS's RCID is equal to the value of RCID_IE. If one's slot offset is higher than this value, the corresponding MSs shall perform repacking using "Delta Duration" field. |
| } | 1 | |
| If (MU Indicator == 1) { | | |
| If (Dedicated MIMO UL Control indicator | | |
| == 1) { | | |
| Dedicated MIMO UL Control IE () | variable | |
| Layer Relevance Bitmap For (i=0; i <n_layers; i++)="" th="" {<=""><th>4</th><th>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</th></n_layers;> | 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 |
| τοι (1–υ, I <n_layers, i++)="" td="" {<=""><td></td><td><u> </u></td></n_layers,> | | <u> </u> |

| If (Allocation flag == 0) { | 1 | De-allocate |
|--|---------------|--|
| RCID IE () | variable | De-anucate |
| If (Resource Shifting Indicator == 1) | variable | |
| (Resource Siming marcator == 1) | | |
| Slot Offset | variable | See definition above in this IE |
| Duration | variable | See definition above in this IE |
| Duration | variable | See definition above in this IE |
| 1 | | |
| 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 | variable 1 | See definition above in this IE See definition above in this IE |
| UIUC | 4 | See definition above in this IE |
| Repetition Coding Indication | 2 | See definition above in this IE |
| If (ACK Disable == 0) { | 2 | See definition above in this IE |
| ACK Channel | 0 | |
| ACK Channel | 8 | |
| ACID | 4 | |
| | 1 | |
| AI_SN | 1 | |
| If (Persistent Flag == 1) { Allocation Period | 5 | See definition above in this IE |
| | 3 | See definition above in this IE See definition above in this IE |
| Number of ACID (N_ACID) MAP ACK Channel Index | 6 | See definition above in this IE See definition above in this IE |
| MAP ACK Channel Index MAP NACK Channel Index | 6 | See definition above in this IE See definition above in this IE |
| MAP NACK Channel Index | 0 | See definition above in this IE |
| If (Resource Shifting Indicator == 1) { | | |
| RCID IE() | variable | |
| Delta Duration | variable | Difference of duration between previous allocation and |
| Dena Duration | variable | 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 |
| | | 10 ons 20 ms nume |
| | | 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. |
| | | Topucking. |
| | | - 1 MSB: 0 == extension, 1 == shrink |
| | | - Other LSBs: the difference of duration between new |
| | | allocation and previous allocation. It can also represent |
| | | the amount of repacking. In case of extension case, the |
| | | slot offset of the MS to be repacked will be increased by |
| | | the difference of duration. Otherwise, the slot offset will |
| | | be reduced by the difference of duration. |
| | | |
| Slot Offset | variable | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| | 1 | 10 have 14 have 1 |

| | | 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 $0 = \text{Single MS}$ $1 = \text{multiple MS}$ |
| Allocation Flag | 1 | 1 = allocate 0 = de-allocate |
| Dedicated MIMO UL Control Indicator | 1 | 0 == MS shall use the stored Dedicated MIMO UL Control information from the last burst allocation where this information was included. 1 = MS uses the Dedicated MIMO UL control information is this IE |
| If (MU Indicator == 0) { | | |
| If (Allocation flag $== 0$) { | | |
| RCID IE () | variable | |
| If (Resource Shifting Indicator== 1) | | |
| N _{SCH} | 4 | |
| Slot Offset | variable | Indicates the start of this persistent allocation in OFDMA slots, with respect to the lowest numbered OFDM symbol and the lowest numbered subchannel in the HARQ region. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame 9 bits – 10 ms frame 10 bits – 20 ms frame |
| If (Allocation Flag == 1) { | | |
| If (Resource shifting indicator == 0) { | | |
| RCID IE () | variable | |
| If (Dedicated MIMO UL Control indicator == 1) { | variable | |
| Dedicated MIMO UL Control IE () | variable | |

| } D : (E | 1 | 0 ' 1 ' |
|---|----------|---|
| Persistent Flag | 1 | 0 = non-persistent allocation |
| | | 1 = persistent allocation |
| N _{SCH} | 4 | |
| SPID | 2 | |
| N_{EP} | 4 | |
| Slot Offset | variable | See definition above in this IE |
| ACK Disable | 1 | When ACK Disable == 1, the allocated subburst does |
| | | not require an ACK to be transmitted by the BS in the |
| | | HARQ ACK BITMAP (see 8.4.5.3.22). In this case, no |
| | | bit position is allocated for the subburst in the HARQ |
| | | ACK BITMAP. For the burst, MS shall not perform |
| | | HARQ retransmission and ignore ACID, AI_SN and |
| | | SPID, which shall be set to 0 by BS if they exist. The |
| | | CRC shall be appended at the end of each sub-burst |
| | | regardless of the ACK disable bit. |
| If (persistent flag ==1){ | | |
| Allocation Period | 5 | Period of the persistent allocation is this field value plus |
| | | 1 (unit is frame) |
| Number of ACID (N_ACID) | 3 | Number of HARQ channels associated with this |
| | | persistent assignment is this field value plus 1 |
| MAP ACK Channel Index | 6 | Index to a MAP ACK channel within the Fast Feedback |
| | | region |
| MAP NACK Channel Index | 6 | Index to a shared MAP NACK channel within the Fast |
| | | Feedback region |
| } | | |
| For (i=0; i <n_layers;i++) 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 |
| SPID | 4 | |
| } | | |
| If (Resource Shifting Indicator == 1) { | | |
| RCID IE () | variable | |
| Delta Duration | variable | Difference of duration between previous allocation and |
| Beita Baration | variable | 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 shout both reallesstion |
| | | 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 persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this |
| | | 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 |
| | | the persistent allocation is equal to a value of RCID_IE, the MS shall update allocation information from this |

| | | T |
|---|---|--|
| | | - 1 MSB: 0 == extension, 1 == shrink |
| | | - Other LSBs: the difference of duration between new |
| | | allocation and previous allocation. It can also represent |
| | | the amount of repacking. In case of extension case, the |
| | | slot offset of the MS to be repacked will be increased by |
| | | the difference of duration. Otherwise, the slot offset will |
| | | be reduced by the difference of duration. |
| Slot Offset | variable | 7 bits – 2.5 ms frame |
| Slot 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. |
| 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 (MU Indicator == 1) { | | |
| If (Dedicated MIMO UL Control indicator | | |
| == 1) { | | |
| Dedicated MIMO UL Control IE () | variable | |
| } | | |
| Layer Relevance Bitmap | 4 | 4 bit bitmap indicating if layer processing should be |
| | | |
| | | skipped in the subsequent 'for loop'. The bit position |
| - | | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: |
| | | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; |
| | | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: |
| For (i=0; i <n_layers; i++)="" th="" {<=""><th></th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer</th></n_layers;> | | 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; (allocation="" 0)="" flag="=" i++)="" if="" th="" {="" {<=""><td>naviahl -</td><td>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer;</td></n_layers;> | naviahl - | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; |
| For (i=0; i <n_layers; ()<="" (allocation="" 0)="" flag="=" i++)="" ie="" if="" rcid="" th="" {=""><td>variable</td><td>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer</td></n_layers;> | variable | 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; (allocation="" 0)="" flag="=" i++)="" if="" th="" {="" {<=""><th>variable</th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer</th></n_layers;> | variable | 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; ()<="" (allocation="" 0)="" flag="=" i++)="" ie="" if="" rcid="" th="" {=""><td>variable variable</td><td>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer</td></n_layers;> | variable variable | 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; ()="" (allocation="" (resource="" 0)="" 1)="" flag="=" i++)="" ie="" if="" indicator="=" rcid="" shifting="" th="" {="" {<=""><th></th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate</th></n_layers;> | | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" flag="=" i++)="" ie="" if="" indicator="=" offset<="" rcid="" shifting="" slot="" th="" {=""><td>variable</td><td>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE</td></n_layers;> | variable | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" duration="" flag="=" i++)="" ie="" if="" indicator="=" offset="" rcid="" shifting="" slot="" th="" {="" }="" }<=""><td>variable</td><td>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE</td></n_layers;> | variable | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" duration="" flag="=" i++)="" ie="" if="" indicator="=" offset="" rcid="" shifting="" slot="" th="" {="" {<="" }=""><td>variable</td><td>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE</td></n_layers;> | variable | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" duration="" flag="=" i++)="" ie="" if="" indicator="=" offset="" rcid="" shifting="" slot="" th="" {="" {<="" }=""><th>variable variable</th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE</th></n_layers;> | variable variable | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE |
| For (i=0; i <n_layers; ()="" ()<="" (allocation="" (resource="" 0)="" 1)="" duration="" flag="=" i++)="" ie="" if="" indicator="=" offset="" rcid="" shifting="" slot="" th="" {="" }=""><th>variable</th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE</th></n_layers;> | variable | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" duration="" flag="=" i++)="" ie="" if="" indicator="=" offset="" rcid="" shifting="" slot="" th="" {="" {<="" }=""><th>variable variable variable variable 1</th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE</th></n_layers;> | variable variable variable variable 1 | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" duration="" flag="" i++)="" ie="" if="" indicator="=" offset="" offset<="" persistent="" rcid="" shifting="" slot="" th="" {="" }=""><td>variable variable variable variable 1 variable</td><td>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE See definition above in this IE</td></n_layers;> | variable variable variable variable 1 variable | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" duration="" duration<="" flag="" i++)="" ie="" if="" indicator="=" offset="" persistent="" rcid="" shifting="" slot="" th="" {="" }=""><td>variable variable variable variable 1 variable variable variable</td><td>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE See definition above in this IE See definition above in this IE</td></n_layers;> | variable variable variable variable 1 variable variable variable | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" ack="" disable<="" duration="" flag="" i++)="" ie="" if="" indicator="=" offset="" persistent="" rcid="" shifting="" slot="" th="" {="" }=""><th>variable variable variable 1 variable variable variable 1</th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE See definition above in this IE</th></n_layers;> | variable variable variable 1 variable variable variable 1 | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" ack="" disable="" duration="" flag="" i++)="" ie="" if="" indicator="=" offset="" persistent="" rcid="" shifting="" slot="" th="" uiuc<="" {="" }=""><th>variable variable variable 1 variable variable variable 1 4</th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE</th></n_layers;> | variable variable variable 1 variable variable variable 1 4 | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" ack="" coding="" disable="" duration="" flag="" i++)="" ie="" if="" indication<="" indicator="=" offset="" persistent="" rcid="" repetition="" shifting="" slot="" th="" uiuc="" {="" }=""><th>variable variable variable 1 variable variable variable 1</th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE See definition above in this IE See definition above in this IE</th></n_layers;> | variable variable variable 1 variable variable variable 1 | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE |
| For (i=0; i <n_layers; ()="" (allocation="" (resource="" 0)="" 1)="" ack="" disable="" duration="" flag="" i++)="" ie="" if="" indicator="=" offset="" persistent="" rcid="" shifting="" slot="" th="" uiuc<="" {="" }=""><th>variable variable variable 1 variable variable variable 1 4</th><th>skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE</th></n_layers;> | variable variable variable 1 variable variable variable 1 4 | skipped in the subsequent 'for loop'. The bit position indicates the layer. The bit value: 0 = skip the layer; 1 = process the layer De-allocate See definition above in this IE See definition above in this IE |

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

Table YYY – Persistent MIMO UL STC HARQ Subburst IE format

| Syntax | Size | Notes |
|--|-------------------------|---|
| Parsistant MIMO III STC HARO Sub Purat IEO (| (bits) | |
| Persistent_MIMO_UL_STC_HARQ_Sub-Burst_IE() { | 1 | |
| Allocation Flag RCID_IE () | variable | |
| Resource shifting indicator | 1 | |
| | 1 | // De allegate |
| if (Allocation Flag == 0) { If (Resource Shifting Indicator ==1) { | | // De-allocate // resource shifting is allowed |
| Duration | | // Tesource simulig is anowed |
| Slot Offset | | |
| Slot Oliset | | |
| 1 | | |
| if (allocation flag ==1) | | // allocation |
| If (Resource shifting indicator == 0) { | | // dilocation |
| Persistent Flag | 1 | |
| If (Persistent Flag == 1) { | 1 | |
| Allocation period (ap) | | |
| MAP NACK Channel Index | 6 | |
| MAP ACK Channel Index | 6 | |
| } | 0 | |
| Boosting | 3 | |
| Tx count | 2 | Tx count shall be set to '0' when Persistent Flag is set |
| 1 x count | 2 | 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 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| if (Ty count 0) (| | regardless of the ACK disable bit. |
| | Λ | |
| | | |
| Repetition County Indicator | | |
| If $(ACK \text{ disable} == 0)$ { | | |
| | 4 | |
| } | | |
| } | | |
| If (Resource Shifting Indicator == 1) { | | |
| | variable | Difference of duration between previous allocation and |
| | | |
| | | |
| | | 7 bits – 2.5 ms frame |
| | | 8 bits – 5 ms frame |
| | | 9 bits – 10 ms frame |
| <pre>if (Tx count == 0) { UIUC Repetition Coding Indicator } If (ACK disable == 0) { ACID } If (Resource Shifting Indicator == 1) { Delta duration</pre> | 4 2 4 variable | HARQ ACK BITMAP (see 8.4.5.3.22). In this case bit position is allocated for the subburst in the HARA 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. Difference of duration between previous allocation newly allocation (reallocation) in slots. OFDMA Frame duration dependant 7 bits – 2.5 ms frame 8 bits – 5 ms frame |

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