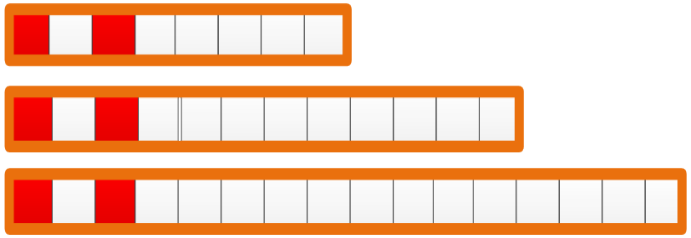
Update on
EPoC Upstream Pilot Proposal

Resource Block Rules

- RBs are fixed in frequency
- Comprised of a single subcarrier and 8,12,16 symbols
- RBs are configured with a RB type and bit loading
  - RB type determines the pilot pattern
  - RBs may have different pilot patterns and bit loading
- A single grant (TX burst) may comprised of a series of RBs of different types and different pilot patterns
- Exclusions
  - A minimum of eight contiguous subcarriers are required between exclusion bands and between exclusions and frame boundaries is eight subcarriers
    - Word more clearly. Minimum occupied? What are frame boundaries? Between the exclusion band and the frame boundary?
  - If less than eight RBs are not allocated

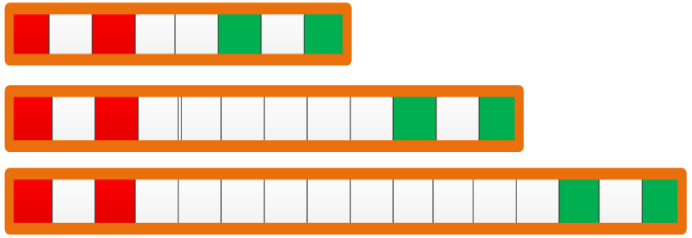
RBs and Pilot Patterns

- Three types of RBs
  - Type 0 – RB does not include pilots
  - Type 1 – RB includes two pilots
  - Type 2 - RB includes two pilots and two low-density data subcarriers (“LD pilots”)
    - How low density is LD? 1, 2 bits less? State clearly.
- Figure below depicts RB type 1 and Type 2 with 8,12 and 16 symbols



RB Type 1

Two pilots on the first and third symbols



RB Type 2

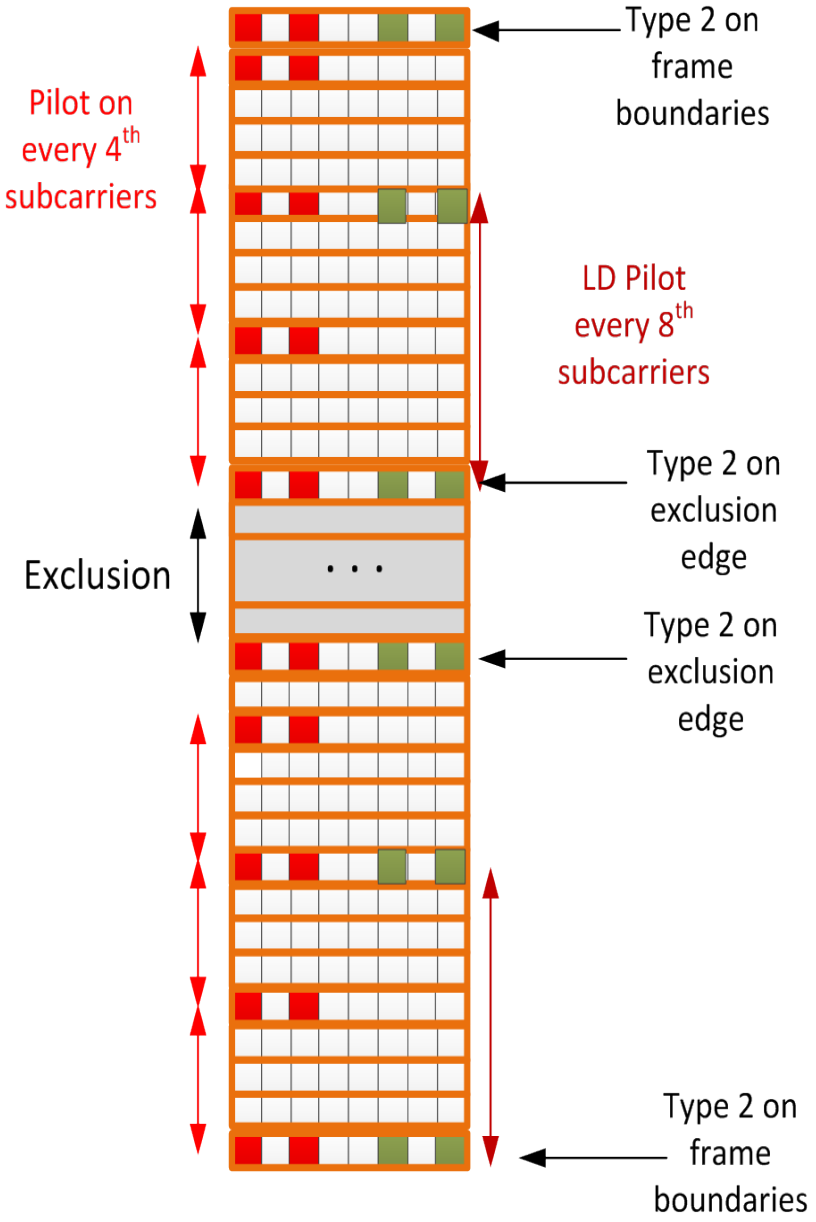
Two pilots on the first and third symbols and two LD pilots on last and second to last symbols

Pilots Rules

- Configurable pilot locations
  - Pilot patterns are configurable during network initialization and constant over the frequency grid
    - Configurable in what way? (e.g. every subcarrier can have a different type?)
    - What are the bounds on configurability?
- Pilots on Boundaries
  - Type-2 RBs are always used on OFDMA frame boundaries and exclusions edge subcarriers
    - Is not “Frame Boundary” treated the same as an exclusion edge?
- Start of a transmission burst
  - First RB in a transmission burst (grant) is always of type #2
    - How do these relate to burst marker placement?
- End of a transmission burst
  - Last RB in a transmission burst (grant) is always of type #2

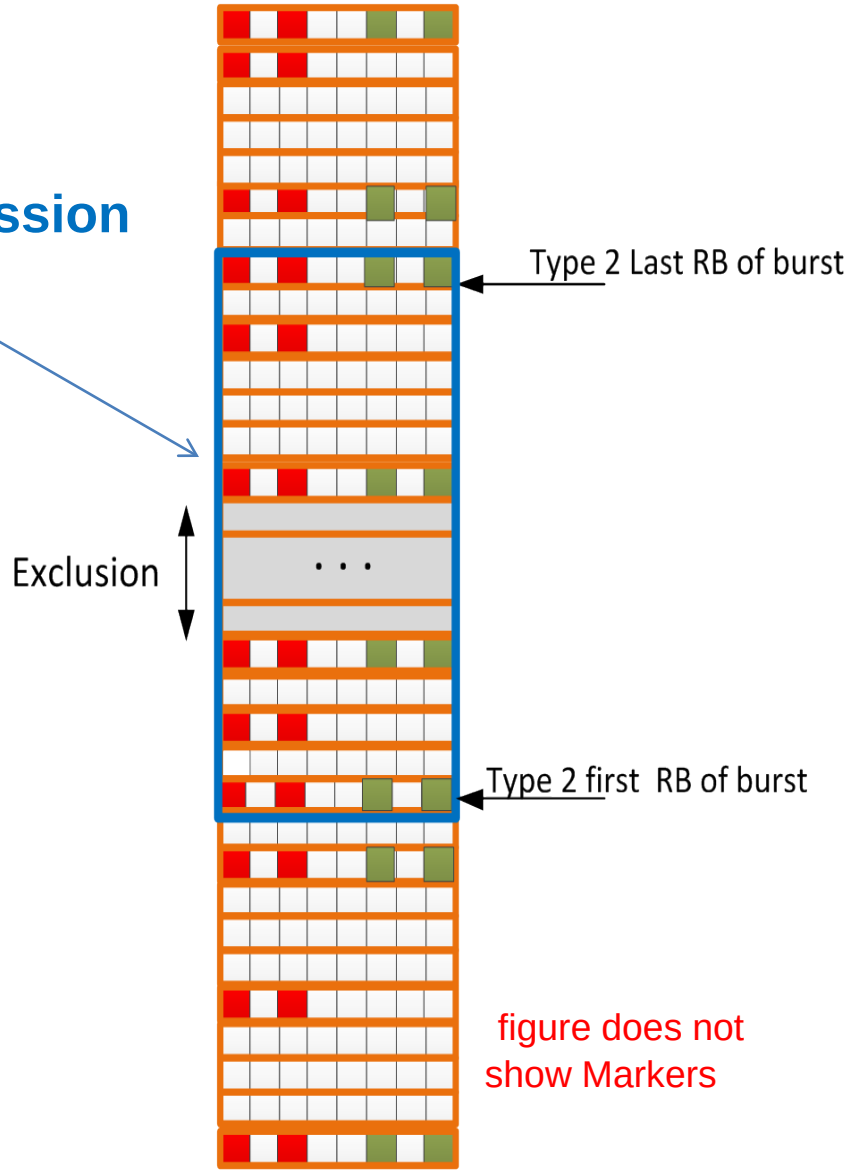
Pilot Rules – Examples (1)

- Pilot grid example:
  - Pilots repeat every four subcarriers
  - LD pilots repeat every eight subcarriers
- This pilot pattern is configured during initialization and is fixed in frequency
- Can you mix RB lengths from RB to next RB? Make clear. Duane: right now, one value for time interleaver (RB) Ed: changing interleaver would require restart. Mark: side need to have an enumerated list for what requires or does not require a restart.



Pilot Rules – Examples (2)

- A transmission burst starts and ends with a Type 2 RB
- These pilots are added over the fixed pilot pattern
- When a start or end “lands” on a Type 1, does it then become a Type 2? How do markers align? and with LD use?
- Why do start/stop pilots necessary? Make part of marker definition (floating) and not part of pilot definition (fixed)?



Configuring the RB Profile

- Profile Information (PI) – 8 bits per RB
  - 2 bits for RB type
  - 4 bits for bit loading
  - 2 reserved
- RB MAP is the mapping of the PIs to subcarriers over the full bandwidth
  - Upto ~4K PIs can be define
- The CLT sends a PI description message with the description of the RB MAP over the DS PLC
- To shorten the PI description message repetitions of strings of PIs can be used
  - Each string of PIs is defined, with the number of contiguous repetitions of the string
    - Use either explicit or algorithmic, don't do both
- Upto TBD entries can be allowed in the message
- What this mean in terms of MDIO registers?
- Perhaps select method that reduces amount of configuration?
  - Would like to understand tradeoffs, so include justification