Title: Zones and more details on the 802.16m frame structure for improved intra-system coexistence

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Source:
Mariana Goldhamer Voice:+972 3 645 6241 mariana.goldhamer@alvarion.com
ALVARION
21a HaBarzel Street, Tel Aviv, Israel

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Purpose:

Relevant system requirements

- **6.4.2 Interference management**
  - IEEE 802.16m shall support interference mitigation schemes
- 7.1.1 Performance improvement

Table 6–Relative throughput of a data only system

Metric	DL data (xWirelessMAN-OFDMA Reference System)	UL data (xWirelessMAN-OFDMA Reference System)
Average user throughput	> 2x	>2x
Cell edge user throughput	> 2x	>2x

- ***7.4 Cell coverage***
- ***7.5 Enhanced multicast-broadcast service***
  - The performance requirements apply to a wide-area multi-cell multicast broadcast single frequency network (MBSFN)

Table 14–MBS minimum spectral efficiency vs. inter-site distance

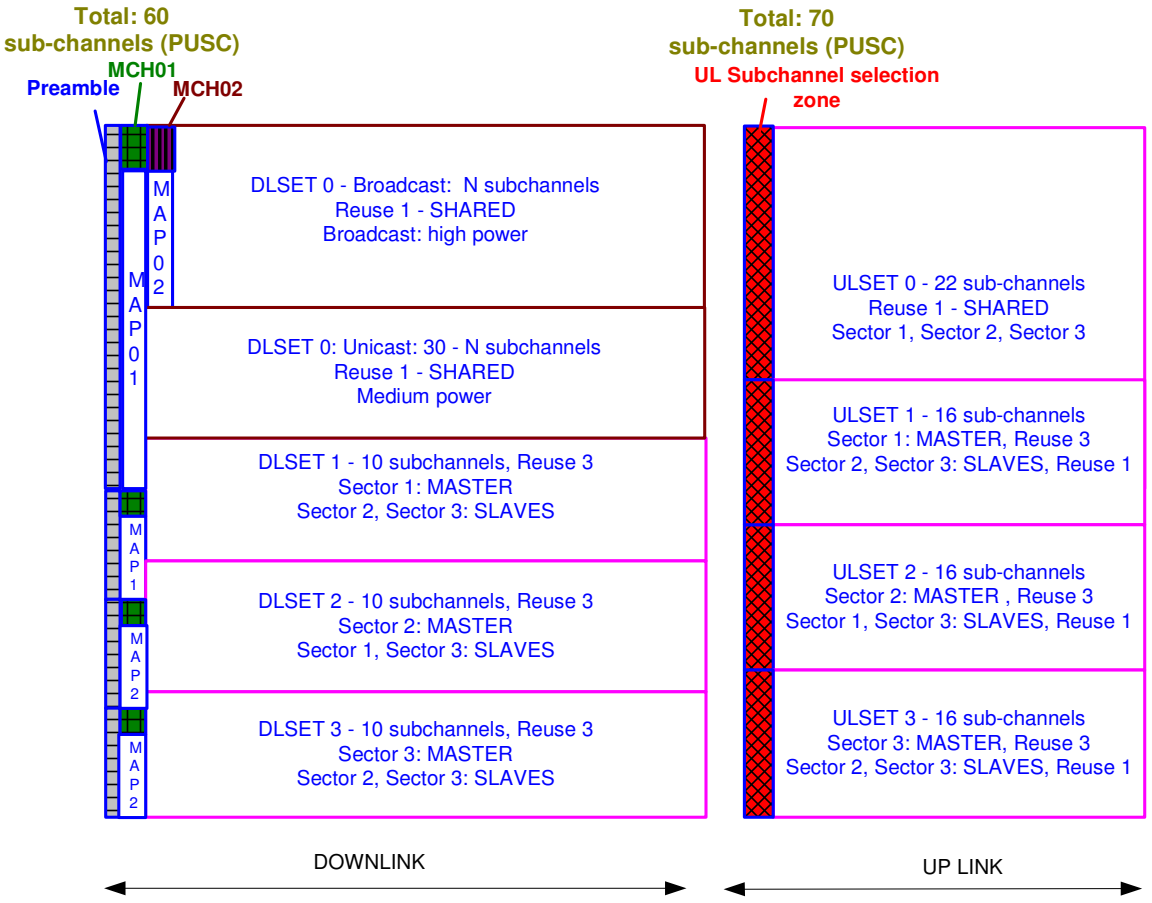
Inter-site distance (km)	Min. spectral efficiency (bps/Hz)
0.5	4
1.5	2

Elements of the solution

- Frame structure, including both Reuse 1 and Reuse 3 approaches
  - Different sub-channel groups for Reuse 1 and Reuse 3 operation
    - Sub-channel groups are named SETs
    - Each SET has its own MAP
    - Before each MAP is transmitted an MCH (MAP Control Header)
  - Power rules per Sector for each SET
  - Dedicated Reuse-1 zone for broadcast traffic
  - Coordinated UL sub-channel selection zone for pro-active opportunistic scheduling and coordinated sounding
- Zones for different Matrix (A, B, C) begin at the start of the Frame
  - Removing the existing limitation of the MAP transmission
    - Beam-forming from the start of the Frame
  - Different bursts are linked in a flexible way

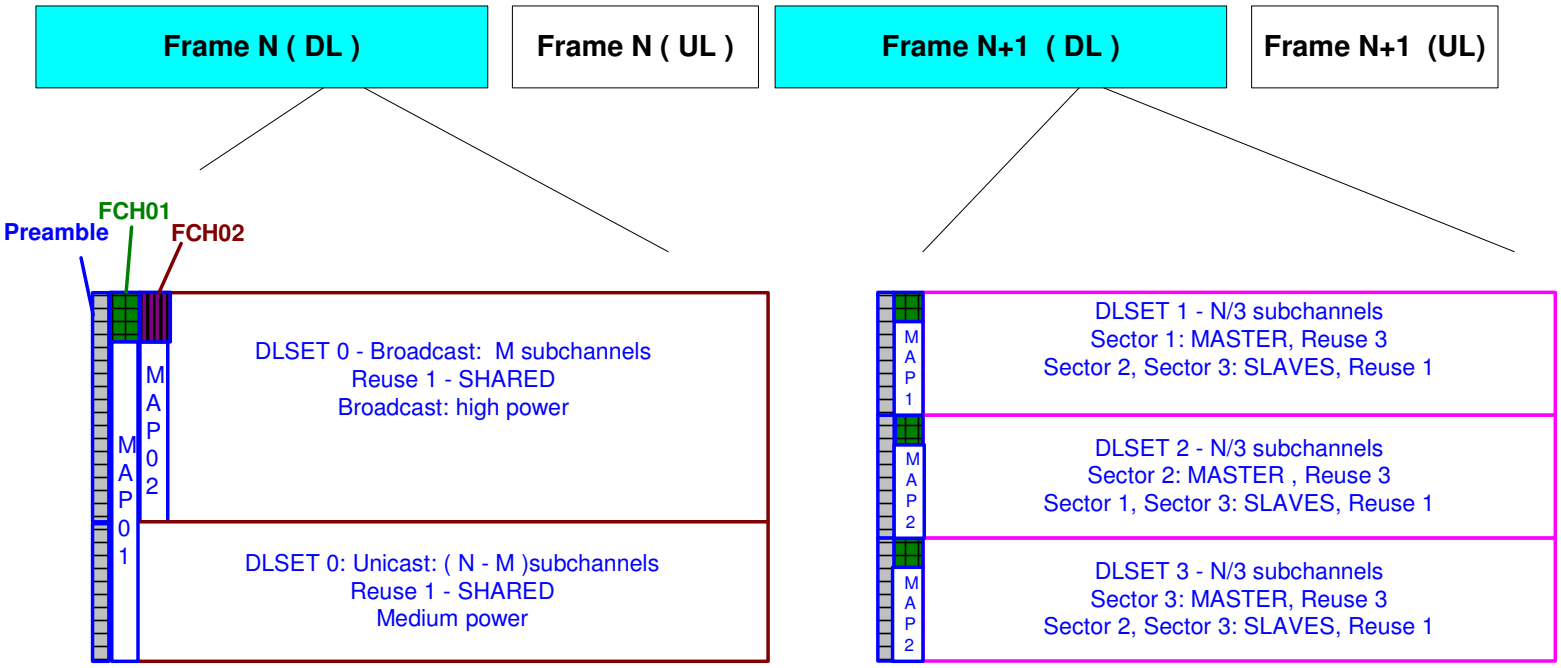
Flexible SET allocation

- MCH (MAP Control Header) points to the actual SET partition (details in C802.16m-08/039)



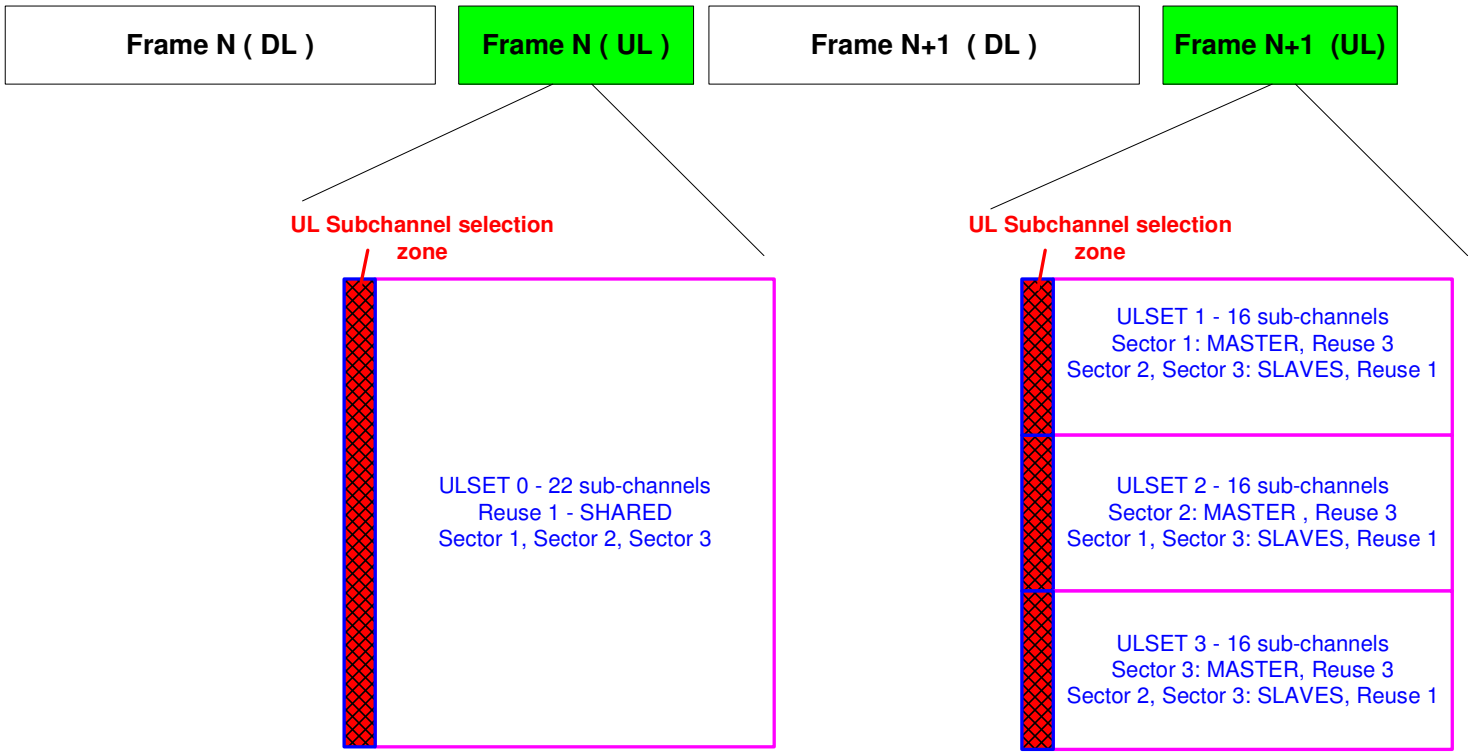
DL alternate frame approach

- One Frame for Reuse 1, a 2nd Frame for Reuse 3



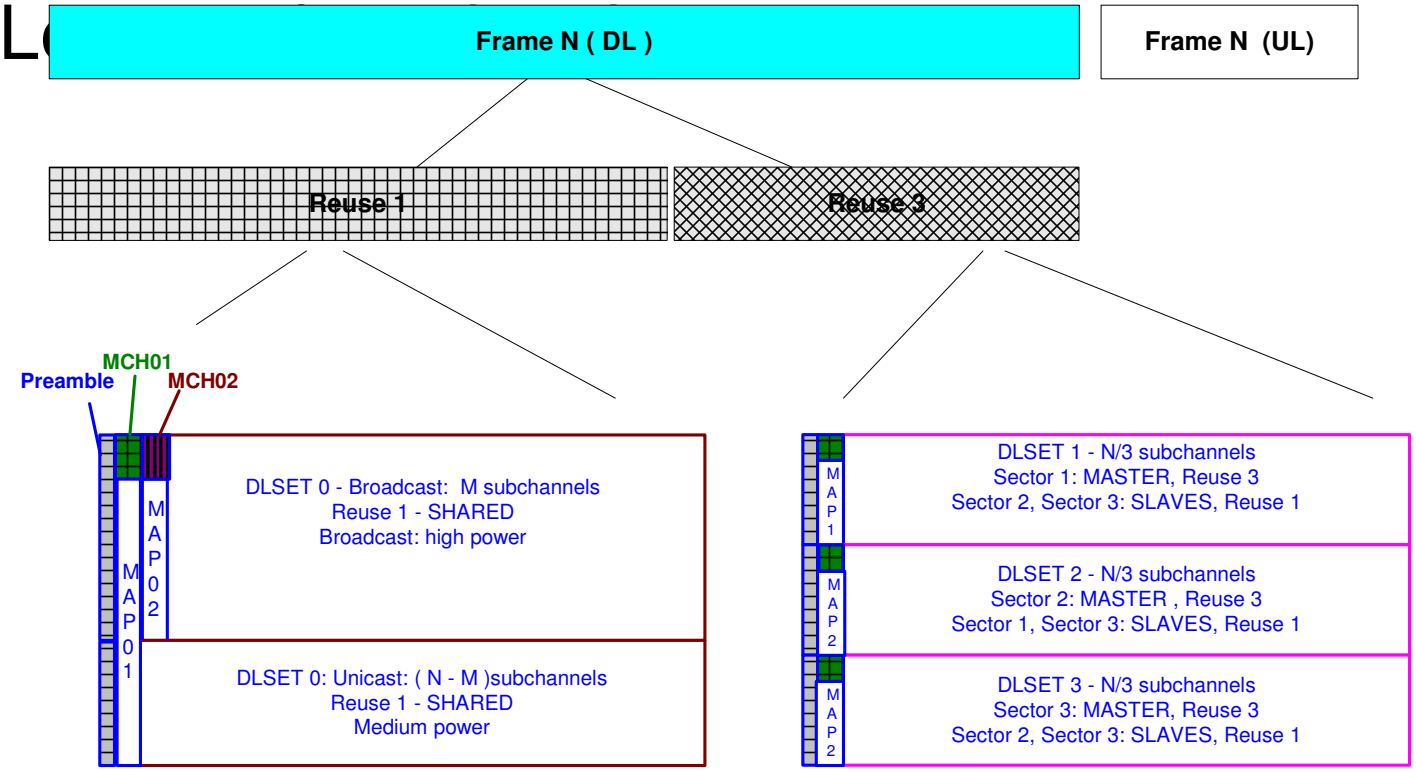
UL alternate frame approach

- One Frame for Reuse 1, a 2nd Frame for Reuse 3



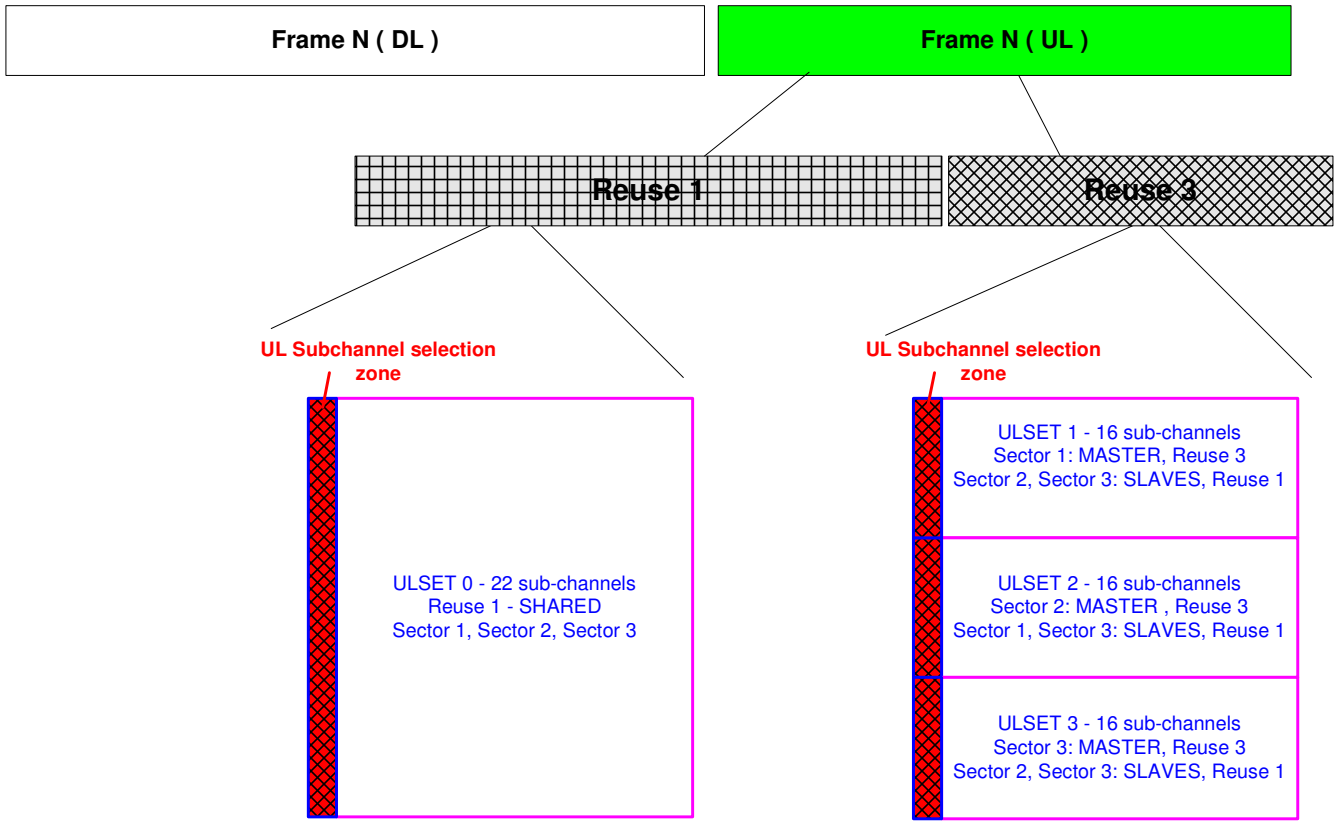
DL frame split approach

- Split in time within a Frame between the Reuse modes
  - L

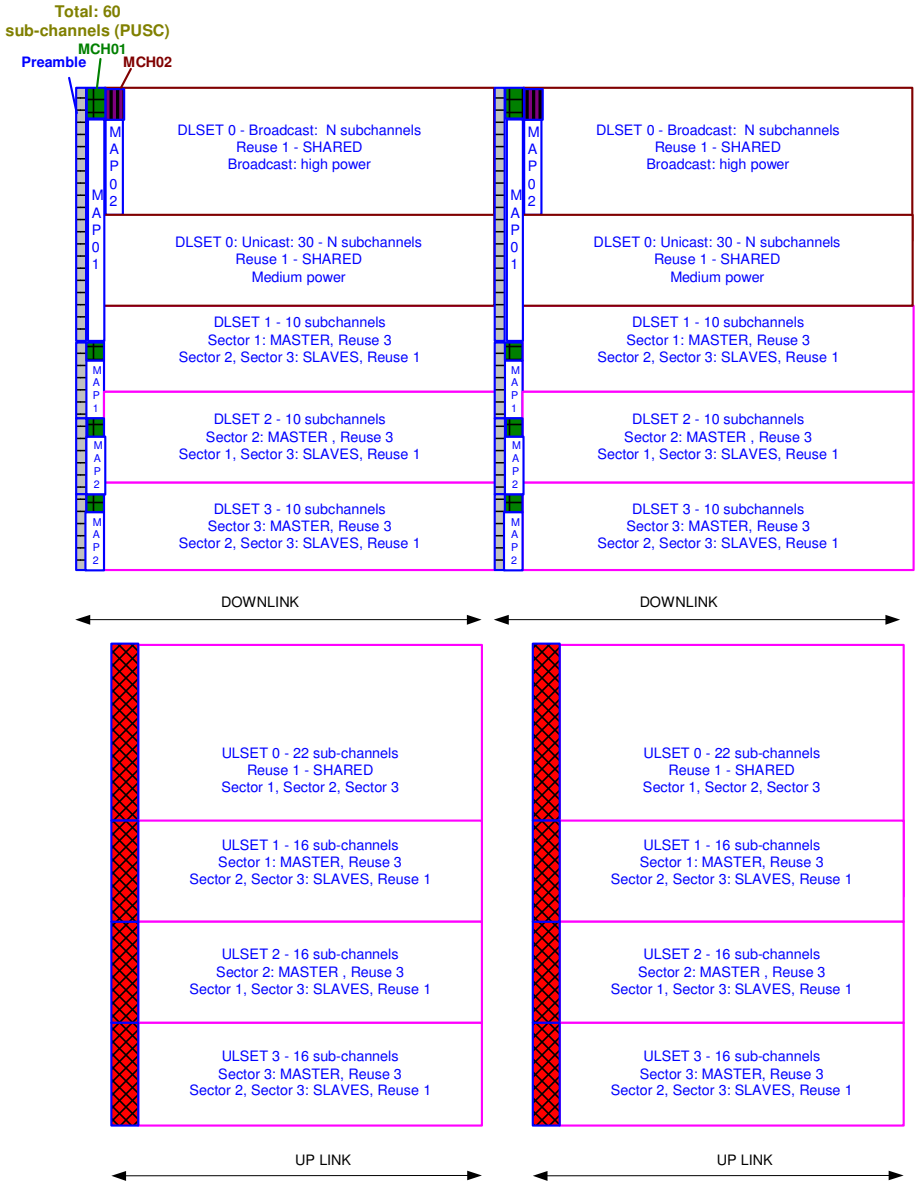


UL frame split approach

- Split in time within a Frame between the Reuse modes



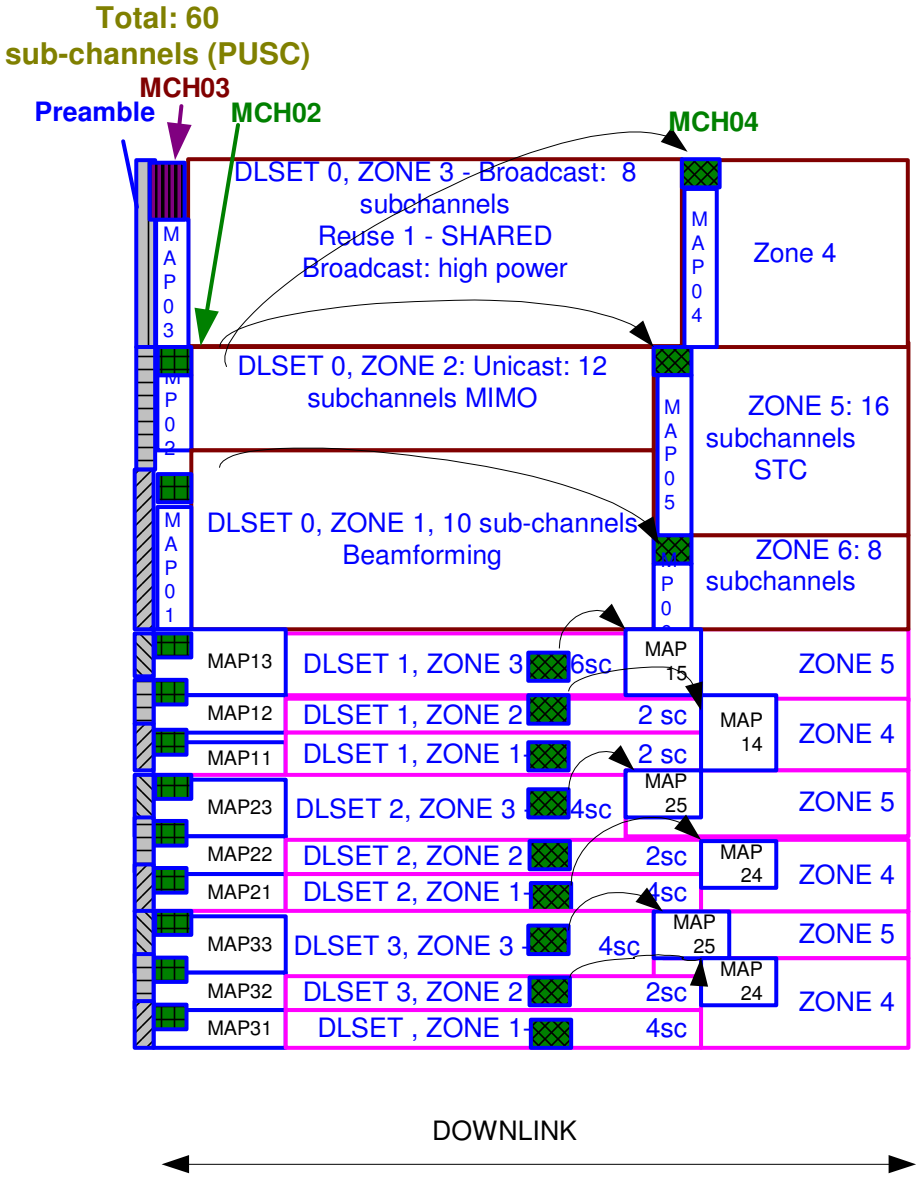
FDD Operation



SET organization in ZONES

- Parallel Zones may start at the beginning of the Frame
  - Each Zone may be used with different Matrix types
    - **Each user takes full advantage of different Matrix modes**
      - **Basis for increasing the cell-size with Beam-forming**
- The MCP can have fixed locations or linked locations
  - Fixed locations are shown inside the Reuse 3 SETs
  - Linked locations are shown inside the Reuse 1 SETs

Example of Zones



Benefits of the new Zone approach

- Today, the range is limited by imposing one mandatory mode for MAP transmission and ranging.
- With the new approach every SS can join the BS using the most convenient Matrix type, and this from the beginning of the Frame.
- For example, an SS which can be reached only in the Beam-forming mode can use now the proper SET for communication with the Base Station.

Legacy support

- Time division is the most suitable approach

Required actions

- **Required Actions**
- ***TOC***
  - **add a sub-clause to the Physical Layer Chapter, named "High-level frame structure"**
- ***Text in SDD***
  - Two possibilities:
  - **Ad-Hoc for the harmonization of this proposal with other proposals related to the frame structure**
    - in order to include in SDD a consolidated text.
  - If this contribution is accepted as it is, the Text for SDD is indicated in the basic contribution