



# Frame structure for IEEE 802.11

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## Introduction

- ✦ New standard 802.16m is being developed for next generation communication
  - Enhanced spectrum efficiency
  - Higher speed
- ✦ Backward compatibility
  - 802.16m shall be backward compatible with legacy system 802.16
  - Systems based on IEEE 802.16m and 802.16e systems shall be able to operate on the same RF carrier, with the same channel bandwidth should be able to operate on the same RF carrier with different channel bandwidths.
- ✦ It is necessary to devise the frame structure of 802.16m frame supporting backward compatibility

## Proposed structure A

### Frequency planning

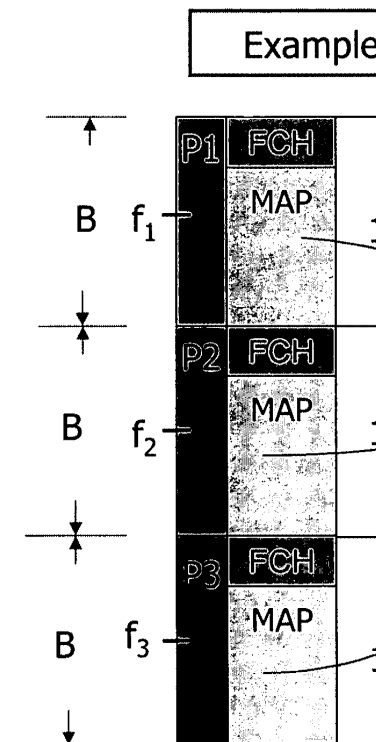
- Occupy the same band class as 802.16e
- A 802.16m channel uses multiple ( $L$ ) contiguous 802.16e channels
- $L$  BS's share the same 802.16m zone with  $L*B$  bandwidth ( 802.16e BW with  $B$ )

### Backward compatibility

- 16e preamble/FCH/MP are kept unchanged
- Only new DL (UL) 16m zones are appended (resource allocation is done by BS cooperation)

### BS cooperation

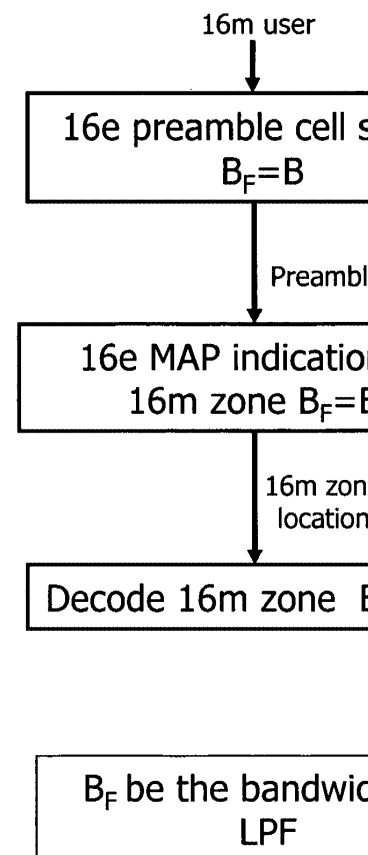
- 16e BS's transmit 16e data using subcarriers with BW  $B$  of their own, while share subcarriers with BW  $B*L$  in 16m zone.



## Proposed structure A

### Cell search by 16m user

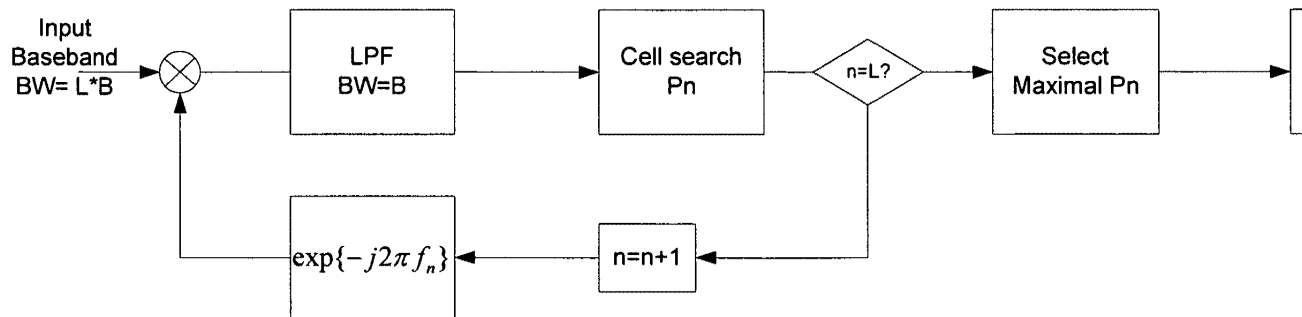
- Baseband BW of  $L*B$
- Detect 16e preamble with BW of  $B$
- Decode FCH/MAP to decide the location of 16m zone
- Retrieve 16m zone with BS with BW of  $L*B$



## Proposed structure A

### 其 16e preamble cell search by 16m user

- RF synthesizer sweeps bands with band size of  $L*B$
- For each band, decide target preamble in each of 16e subband
  - ▶ Partition the band into several 16e subbands
  - ▶ Transform each of the subband signal to baseband using freq. offset manipulation
  - ▶ Filter the low-pass signal with BW B
  - ▶ Detect the preamble signal in BW B
  - ▶ Select the preamble with maximal detected power as desired preamble



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