Project	**IEEE 802.16 Broadband Wireless Access Working Group** <**http://ieee802.org/16**>
Title	**Subcarrier Based Polling**
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Re:	
Abstract	**Changes suggested in IEEE 802.16ab-01/01**
Purpose	This document is submitted in response for the Call for Comments IEEE 802.16ab-01/02
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Subcarrier Based Polling

References

[1]   IEEE P802.16/D3-2001. Local and Metropolitan Area Networks—
Part 16: Standard Air Interface for Fixed Broadband Wireless Access
Systems. 2001-05-25

This section describes the MAC functions related to Subcarrier Based Polling (SBP).

Arrangement of SBP Multicast Groups

BS divides all the SSs participating in SBP into multicast groups each one identified
by certain CID. A special protocol is used to inform each SS on the group it belongs to plus
the SS Index (or range of indexes) within the group.
The following new parameters should be added to the table 109, 11.1.4.1 MCA-REQ
and MCA-RSP TLV Encodings [1] .

Name	Type	Length	Value
SBP Group Index Assignment	3	2	0 to TBD, index value
SBP Group Start Index Assignment	4	2	0 to TBD, start index value
SBP Group End Index Assignment	5	2	0 to TBD, end index value

TLV with Type = 3 appears only together with Multicast CID (Type = 1).
TLVs with Types = 4, 5 appear only together and together with Multicast CID (Type = 1).

Allocation of Transmission Opportunities

When BS allocates one or several time slot for the given CID. It means that all the
SSs belonging to the group have to transmit. The space of transmission opportunities is two-
dimensional (time-subcarrier space). The opportunities are numbered in the order
 subcarriers first . Each SS chooses for the transmission the opportunity (opportunities) that
corresponds its index (range of indexes) in the group (see Figure 1). For example,

- If SS got an index 54, it means that the transmission opportunity is the subcarrier
  number 6 at the second symbol duration interval (assuming 48 subcarriers in use)
- If SS got an index range 112-115, it means that the transmission opportunity is the set
  of subcarriers with numbers 16 to 19 at the 3d symbol duration interval: $112 = 48 * 2 + 16$

Transmission / reception may be performed in two modes:
1. Transmission present / absent means that SS has / does not have demand

2. Transmission contains one bit modulated using by TBD modulation. Then 1 / 0
   means / presence absence of demand

BS decides on the presence of demand according to majority voting rule for all transmissions
received from the given SS at the current act of polling.

Subcarrier Based Polling Slots

| Subcarrier #1 | SS #1 | SS #13 | ..... | SS #121 |

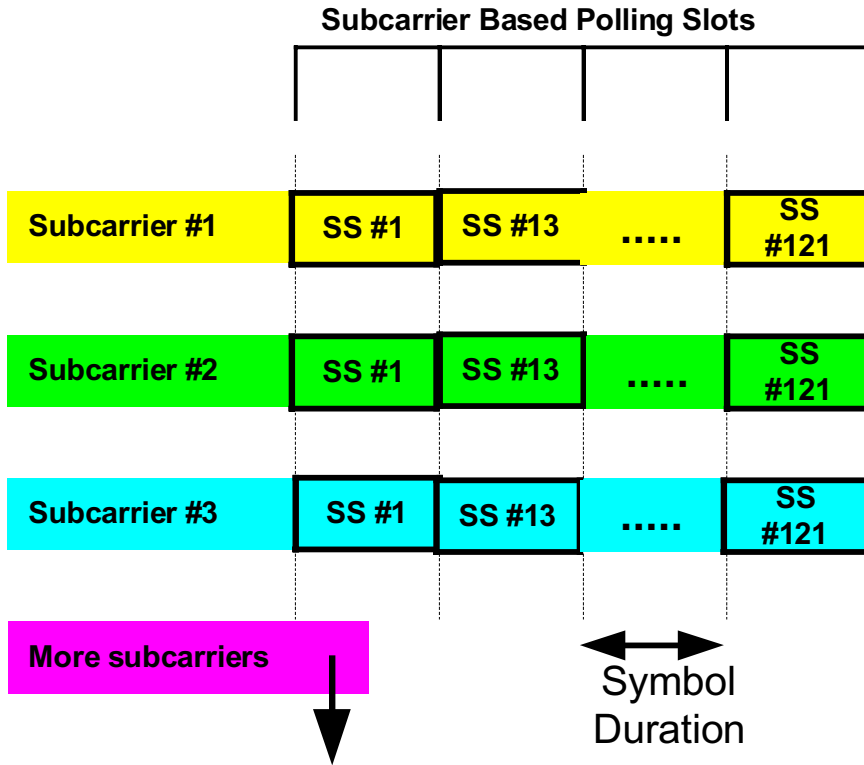| Subcarrier #2 | SS #1 | SS #13 | ..... | SS #121 |

| Subcarrier #3 | SS #1 | SS #13 | ..... | SS #121 |

More subcarriers

Symbol
Duration

Figure 1. SBP Transmission Example