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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>** |
| Title | **Backbone procedures for non-contention based association** |
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| Re: | Call for Comment on P802.16g Baseline Document |
| Abstract | This contribution proposes two backbone messages for non-contention based association with corresponding usage examples. |
| Purpose | To be discussed in Legacy Messages Ad-Hoc, IEEE802.16g |
| Notice |  |
| Release |  |
| Patent Policy and Procedures |  |

# Backbone procedures for non-contention based association

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## 1. Introduction

Non-contention based association procedures are described in 6.3.20.1.2 and 6.3.20.1.3, IEEE802.16e/D6 document. The backbone procedures also need to be defined for its proper operations between Serving BS and Recommended BS for association. In this contribution, we define two new backbone messages for non-contention based association procedures, which are Association Notification (ASC-notification) message and Association Confirm (ASC-confirm) message.

If delay occurs during backbone communication between BSs, "successful rendezvous ratio" of non-contention based association may be decreased significantly. Therefore, we introduce a simple method to compensate the delay incurred over backbone communications using "Timestamp" field in Global Message Header which may be included in each backbone message. (See Fig. 1 below.)

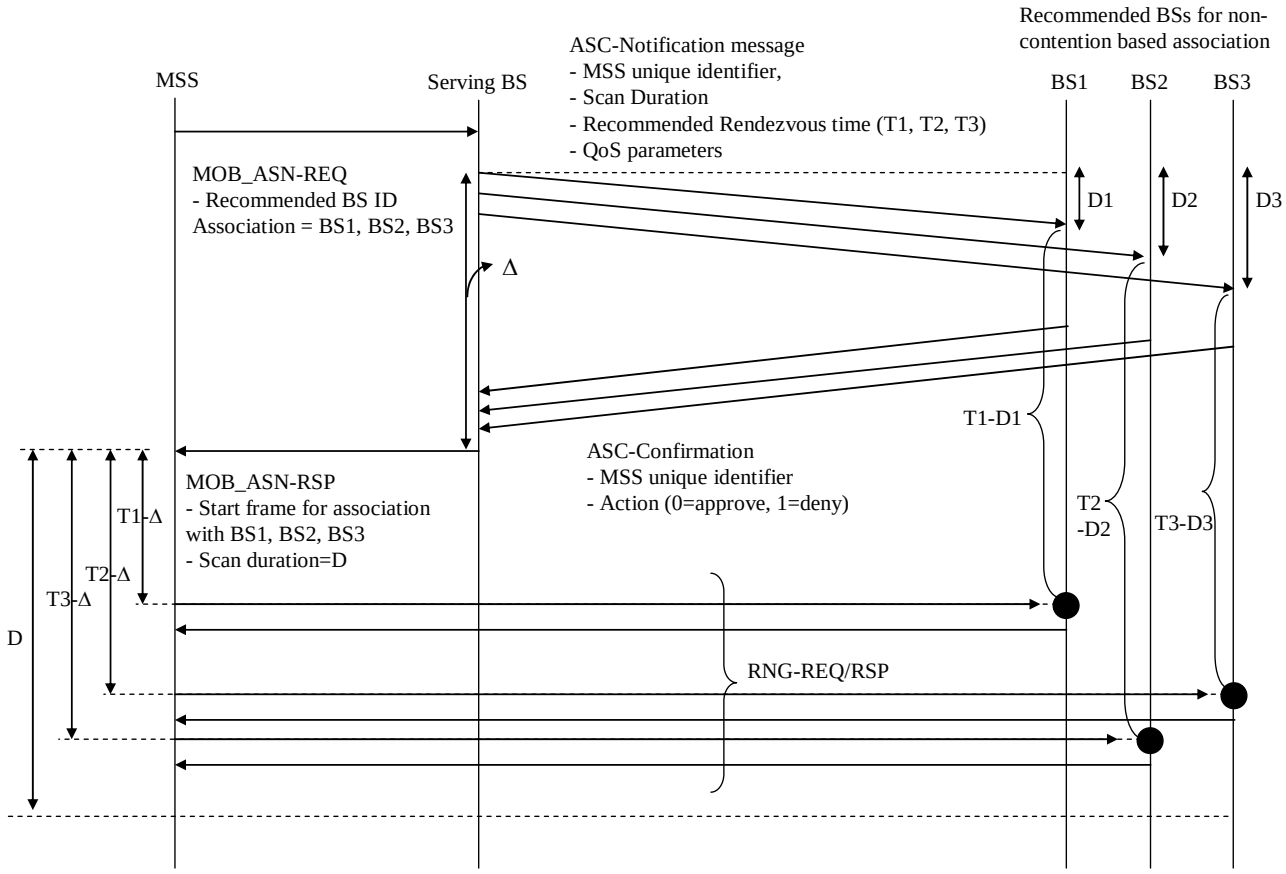


Fig. 1 An example of non-contention based Association

## 2. Proposed Text Change

[Add new subsection 14.5.9.5.1 Non-contention based association, line 52, pp. 13, IEEE802.16g-04/03r1:]

14.5.9.5.1 Non-contention based Association

The section describes backbone procedures for non-contention based Association specified in 6.3.20.1.2, which are performed using two Backbone messages; Association Notification (ASC-notification) message defined in 14.5.10.xx and Association Confirm (ASC-confirm) message in 14.5.10.yy.

Upon receiving MOB_SCN-REQ message with Scan type=1, 'Association', BS shall transmit ASC-notification message to each BS identified as Recommended BS for Association in MOB_SCN-REQ message. For each BS, a BS transmitting ASC-notification message shall determine an offset indicating that the BS receiving this message is requested to provide non-contention based ranging opportunity after the offset for the MSS specified in the message.

A BS receiving ASC-notification message shall transmit ASC-confirm message indicating whether it approves the requested uplink resource allocation for non-contention based ranging opportunity by setting Action Code=0, 'approve', or deny by setting Action Code=1, 'deny'. If BS approves the request, it shall provide the specified MSS with non-contention based ranging opportunity at the time indicated by Frame offset in ASC-notification message. A BS may evaluate Frame offset in ASC-notification message by compensating the delay incurred during ASC-notification message is being transmitted by referring to the Time Stamp value in Global Message Header defined in 14.5.10.xx.

After receiving ASC-confirm message from each BS, BS shall include identifier and rendezvous time in MOB_SCN-RSP message only for BSs which approve the requested uplink resource allocation for non-contention based ranging opportunity. When BS determines rendezvous time, it may compensate the delay incurred by backbone procedures using Time Stamp value in Global Message Header defined in 14.5.10.xx.

[Add new subsection under 14.5.10.xx Global Message Header, line 11, pp. 14, IEEE802.16g-04/03r1:]

14.5.10.xx Global Message Header

| Type | Size | Notes |
|---|---|---|
| Message Type | 8 bits | |
| Sender ID | 48 bits | Unique identifier of a sender |
| Target ID | 48 bits | Unique identifier of a receiver |
| Time Stamp | 32 bits | Number of millisecond since midnight GMT (set to 0xffffffff to ignore) |
| Num Records | 16 bits | |

[Add new subsection under 14.5.10.xx Association Notification (ASC-notification) message, line 11, pp. 14, IEEE802.16g-04/03r1:]

14.5.10.xx Association Notification (ASC-notification) message

If BS receives a MOB_SCN-REQ message with Scan type=1, ‘Association’, it shall generate Association Notification (ASC-notification) message in the format shown in Table xxx in order to request a uplink resource allocation for non-contention based association during Scan duration.

Table xxx – Association Notification (ASC-notification) message format

| Field | Size | Notes |
|---|---|---|
| Global Message Header | 152 bits | Refer to 14.5.10.nn Global Message Header |
| For (j=0; j<Num_Records; j++) { | | |
| MSS unique identifier | 48 bits | 48-bit unique identifier of MSS transmitting MOB_SCN-REQ message with Scan type=1, ‘Association’. |
| Scan duration | 8 bits | Duration (in unit of frame) of the requested scanning period in MOB_SCN-REQ message. |
| Frame offset | 8 bits | Frame offset for recommended rendezvous time in unit of millisecond. |
| Num_SFID_Records | 8 bits | |
| For (i=1; i<Num_SFID_Records; i++) { | | |
| SFID | 32 bits | |
| Num_QoS_Records | 8 bits | |
| For (i=1; i<Num_QoS_Records; i++) { | | |
| TLV encoded information | variable | 11.13 Service flow management encodings. |
| } | | |
| } | | |
| Security field | TBD | A means to authenticate this message |
| } | | |

The following parameters shall be included in the ASC-notification message.

MSS unique identifier
48-bit unique identifier of MSS transmitting MOB_SCN-REQ message with Scan type=1, ‘Association’.

Scan duration
Duration (in units of frames) of the requested scanning period in MOB_SCN-REQ message.

Frame offset
Time offset (in unit of frame) that Serving BS requests Target BS to provide non-contention based ranging opportunity for the MSS. The offset shall be calculated from the time when serving BS transmits this message, and may be evaluated by referring to Timestamp field in this message.

[Add new subsection under 14.5.10.yy Association Confirm (ASC-confirm) message, line 11, pp. 14, IEEE802.16g-04/03r1:]

Association Confirm (ASC-confirm) message shall be transmitted in response to ASC-confirm message in the format shown in Table yyy. A BS may approve the requested uplink resource allocation for non-contention based ranging opportunity by setting Action Code=0, ‘approve’, or deny by setting Action Code=1, ‘deny’.

Table yyy – Association Confirm (ASC-confirm) message format.

| Field | Size | Notes |
|---|---|---|
| Global Message Header | 152 bits | Refer to 14.5.10.nn Global Message Header |
| For (j=0; j<Num_Records; j++) { | | |
| MSS unique identifier | 48 bits | 48-bit unique identifier of MSS requesting non-contention based association by transmitting MOB_SCN-REQ message. |
| Action Code | 1 bit | 0: approve<br>1: deny |
| reserved | 7 bits | |
| } | | |
| Security field | TBD | A means to authenticate this message |
| } | | |

The following parameters shall be included in the ASC-notification message.

MSS unique identifier
48-bit unique identifier of MSS transmitting MOB_SCN-REQ message with Scan type=1, 'Association'.

Action Code
Indicates whether BS approves the requested non-contention based ranging opportunity (Action Code=0) or not (Action Code=1).

## 3. References

[1] IEEE802.16e/D6

[2] IEEE802.16g-04/03r1, "Baseline Document – P802.16g Management Plane Procedures and Services"