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Title	**MS MAC Handover Procedure in an MR Network – Network Topology Acquisition and MS Scanning**	
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Re:	Submitted in response to Call for technical proposals issued by IEEE 802.16j on 2006-10-15	
Abstract	This document proposes network topology acquisition and MS scanning procedure related to MS handover in an IEEE 802.16j network where both MR-BS and its subordinate RSs in an MR-cell transmit their own broadcast control message such as preamble, FCH, DCD, UCD, DL-MAP and UL-MAP.	
Purpose	This contribution is provided as input for the IEEE 802.16j amendment.	
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1. Introduction

The proposed MAC handover scheme will enable an 802.16e compliant MS to handover seamlessly in an MR network following the MAC handover procedure defined in subclause 6.3.22 of IEEE 802.16e-2005. This contribution proposes additions/modifications to Network Topology Advertisement and MS scanning procedure defined in subclause 6.3.22.1 of IEEE 802.16e-2005.

Figure 1 depicts the seven handover cases that are covered in this contribution.
Please refer to Sections 1.1 and 1.3 of [1] for terminologies and assumptions used in this contribution.

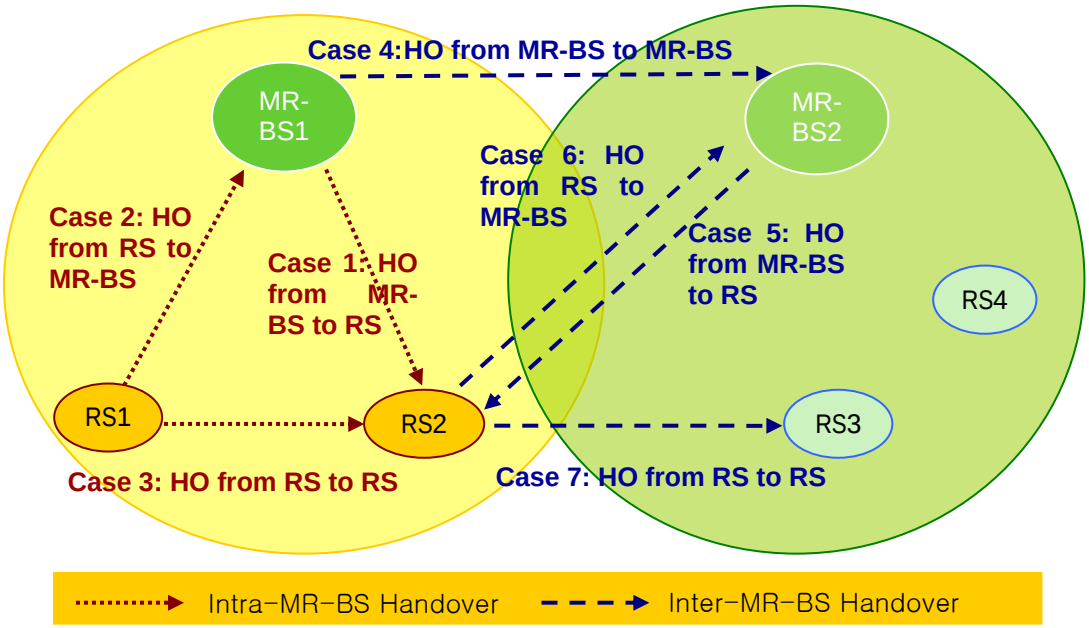


Figure 1 Seven Handover Cases in an MR network

2. Network topology acquisition to aid a MS handover

2.1 Network Advertisement

An access station (i.e. MR-BS or RS) shall periodically broadcast a MOB_NBR-ADV message to all MSs that belong to its coverage. The MOB_NBR-ADV message includes access link channel information of other infrastructure stations(ISs). Since the objective of the MOB_NBR-ADV is to aid in handover, the stations in the list are potential target access stations recommended by the broadcasting access station for all MSs directly connected to it. This facilitates quick MS synchronization with the target access station by removing the need for an MS to monitor UCD/DCD broadcasts.

Parameters for the recommended stations in a MOB_NBR-ADV message can be found in Table 1. While this information is obtained over the backbone in the legacy 802.16e network, it may be obtained over relay links as well as the backbone in an MR network.

Therefore, we propose two new MAC management message *NBR_ADV-INFO* and

NBR_ADVINFO-REQ in an MR network for this operation. These two message formats can be found in Section 3.

In a centralized MR network using simple RSs, an MR-BS owns all the information to generate a MOB_NBR-ADV message for every subordinate RS in its MR-Cell. In this case, an MR-BS generates an MOB_NBR-ADV message for individual simple RS and delivers this to it using primary CID between the MR-BS and the RS. Then, the RS simply broadcasts the received MOB_NBR-ADV message contents to its MSs. For this case, new messages are unnecessary.

On the other hand, depending on the capability of RSs in a Hybrid or Distributed system, an MR-BS is assumed to have some parameter values for its subordinate RSs but there might be other parameter values that each RS needs to inform the MR-BS. In this case, an RS informs the MR-BS of those parameter values by transmitting a NBR_ADV-INFO message using primary CID between the MR-BS and the RS. For example, if UCD configuration change is determined by an RS, the RS should update the MR-BS on UCD configuration change count value. In order to help RSs with obtaining the information to generate a MOB_NBR-ADV message, the MR-BS first determines a list of ISs in each subordinate RS's MOB_NBR-ADV. (The algorithm used to determine the list for each RS is out of scope for this proposal.) Next, the MR-BS transmits a NBR_ADV-INFO message to each subordinate RS including access channel information about the determined list of ISs for its MOB_NBR-ADV message. Whenever there is a change in terms of the member of IS list in a MOB_NBR-ADV message broadcasted by a particular RS or in terms of any parameter value of any IS in the list, the MR-BS transmits NBR_ADV-INFO to update the affected RSs.

As an alternative, depending on the capability of RSs, an RS is allowed to provide its upstream and downstream stations with its own access link information using a NBR_ADV-INFO message. Hence, RSs can collect the information from its upstream and downstream stations without using multi-hop path to the MR-BS. To obtain access link information for ISs that are not upstream or downstream to the RS but are potential target access stations of MSs, the RS can send a NBR_ADVINFO-REQ message to the MR-BS with the identity of the ISs of interest. When an upstream RS receives the NBR_ADVINFO-REQ message from its downstream RS, it reads Requested_Station_ID parameter to see if it owns the information of any requested ISs. If so, the upstream RS responds with a NBR_ADV INFO message to the downstream RS. Then, if there are other Requested_Station_ID(s) that it couldn't provided the information, it forwards the NBR_ADVINFO-REQ message to its upstream IS. Resultantly, if access link information of all the requested IS can be provided by intermediate RSs, the message doesn't have to be delivered to the MR-BS. This can reduce the communication overhead by reducing the size of the message and the number of the message forwarding. An RS may learn about which other ISs besides its upstream and downstream ISs might be potential target access stations for MSs in its coverage area by reading MOB_SCN-REP messages from the MSs.

The access station prepares a MOB_NBR-ADV message based on the information collected from the received *NBR_ADV-INFO* messages and from other means if any. Then, the access station transmits the MOB_NBR-ADV message to its associated MSs.

If a recommended station in a MOB_NBR-ADV message involves an Intra MR-BS handover, the bit numbers 0-7 of HO process optimization field in MOB_NBR-ADV are likely set to 1. Those values are used to indicate omission of some network re-entry message exchanges including SBC-REQ message, PKM authentication messages, network address acquisition messages, time of day acquisition messages, and TFTP management messages as well as to enable full service/operational state transfer and post handover data forwarding.

Table 1. Parameters in a MOB_NBR-ADV message that need to be obtained from potential target stations

MOB_NBR-ADV
• PHY Profile ID
• FA Index
• BS EIRP
• Preamble Index/ Subchannel Index
• HO Process Optimization
• Scheduling Service Supported
• DCD Configuration Change Count
• UCD Configuration Change Count
• Mobility feature supported
• DCD_settings
• UCD_settings
• PHY Mode ID

2.2 MS scanning

An access MR-BS or RS may allocate scanning intervals to an MS seeking and monitoring suitability of a potential target access station for a handover. As defined in IEEE 802.16e-2005, an MS may request an allocation of scanning intervals and a certain type of association with each potential target access station using a MOB_SCN-REQ message. The function of association is to enable the MS to acquire and record ranging parameters and service availability information for the purpose of proper selection of handover target and/or expediting a future handover to a target access station. In IEEE 802.16e network, three association levels are defined.

Association Level 0: Scan/Association without coordination
Association Level 1: Association with coordination
Association Level 2: Network assisted association reporting

The requested association level is encoded in the *scanning type* field of the MOB_SCN-REQ message. Upon receiving a MOB_SCN-REQ message, the access station responds with a MOB_SCN-RSP message. As in IEEE 802.16e-2005, the access station can also issue an unsolicited MOB_SCN-RSP. In the MOB_SCN-RSP message, the access station encodes the association details including scanning type and ranging region at a predefined rendezvous time in terms of relative frame number. Association levels 1 and 2 require coordination between the MS and the requested potential target access station. The coordination will be facilitated by the MS's current access station.

In IEEE 802.16e-2005, coordination between BSs can be achieved over the backbone. However, the coordination needs to take place over the relay links and/or the backbone in 802.16j networks. Therefore, we design two new MAC management message *ST_SCN-REQ* and *ST_SCN-RSP* for the coordination over the relay links.

When the scanning type of a requested potential target access in the MOB_SCN-REQ message >=1, we propose the following response:

- **Default**: As the simplest solution, set "Scanning Type = 0" for the requested station in the MOB_SCN-RSP message. In this case, additional MAC management message exchange over relay links is not necessary. However, this case will not provide a reserved ranging

region and thus the MS has to use contention –based ranging allocations.

- **Optional**: The access station may request coordination with the recommended station specified in the MOB_SCN-REQ message via an exchange of *ST_SCN-REQ* and *ST_SCN-RSP*. The procedure to exchange these messages can be found in Table 2 (a) and (b).

As in IEEE 802.16e-2005, when association level 2 is chosen, the current access station needs to collect RNG-RSP from the potential target access station(s) that have received the CDMA ranging code from the MS, and then to transmit the aggregated RNG_RSP information to the MS using the MOB_ASC_REP message. In an MR network, RNG-RSP will be transmitted to the current access station over the relay links and/or the backbone.

Figure 2 shows an example of signaling in relation to MOB_SCN-REQ/RSP and ST_SCN-REQ/RSP for six cases of Figure 1 (except Case 4). Case 4 is not included because it follows the 802.16e procedure exactly.

Table 2 Signaling process for ST_SCN-REQ/RSP messages
(a) when the recommended target is for Intra MR-BS handover

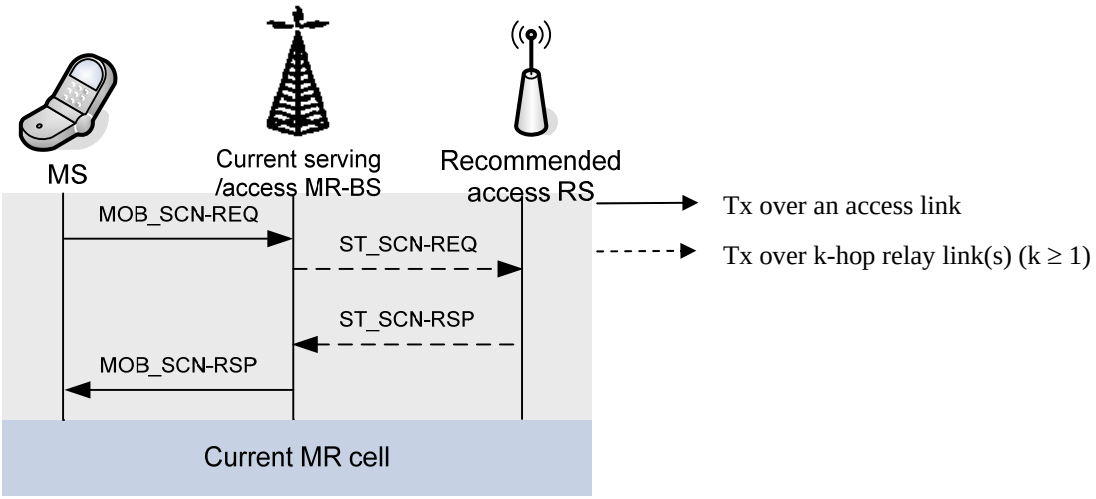
Recomm / Current	MR-BS in the same MR cell	RS in the same MR cell
MR-BS	N/A	The access MS-BS and recommended RSs can be k-hop (k≥1) away from each other. They know a relay path to reach each other because the RSs are under control of the access MR-BS. Therefore, they communicate with each other using this k-hop path. If the MR-BS does not know the allocation detail at the target access RS: (1) The access MR-BS issues a *ST_SCN-REQ* message destined to the recommended RSs. (2) Upon receiving the request, the recommended RS responds with a *ST_SCN-RSP* message. If the MR-BS knows the allocation at the target access RS, the MR-BS can reply to the MS with a MOB_SCN-RSP message without consulting the target access RS.

RS	The access RS and recommended MR-BS can be k-hop (k≥1) away from each other. They know a relay path to reach each other because the RSs are under control of the access MR-BS. Therefore, they communicate with each other using this k-hop path. (1) The access RS issues a *ST_SCN-REQ* message destined to the serving MR-BS. (2) Upon receiving the request, the serving MR-BS replies with a *ST_SCN-RSP* message.	If access and recommended RSs can communicate directly over the 1-hop relay link between them: (1) The access RS issues a *ST_SCN-REQ* message directly destined to the recommended RSs. (2) Upon receiving the request, the recommended RS replies to the access RS with a *ST_SCN-RSP* message. Both RSs have a k-hop (k≥1) relay path to the serving MR-BS. If the access and recommended RSs cannot communicate directly (i.e., no 1-hop relay link between them): (1) The current access RS issues a *ST_SCN-REQ* message destined to the serving MR-BS. (2) Then, the MR-BS forwards this request message to the recommended RSs. (3) Upon receiving the request, the recommended RS replies to the MR-BS with a *ST_SCN-RSP* message. (4) Then, the MR-BS transmits a *ST_SCN-RSP* message to the current access RS. If the MR-BS knows the allocation detail at the target access RS, the steps (2) and (3) are skipped.

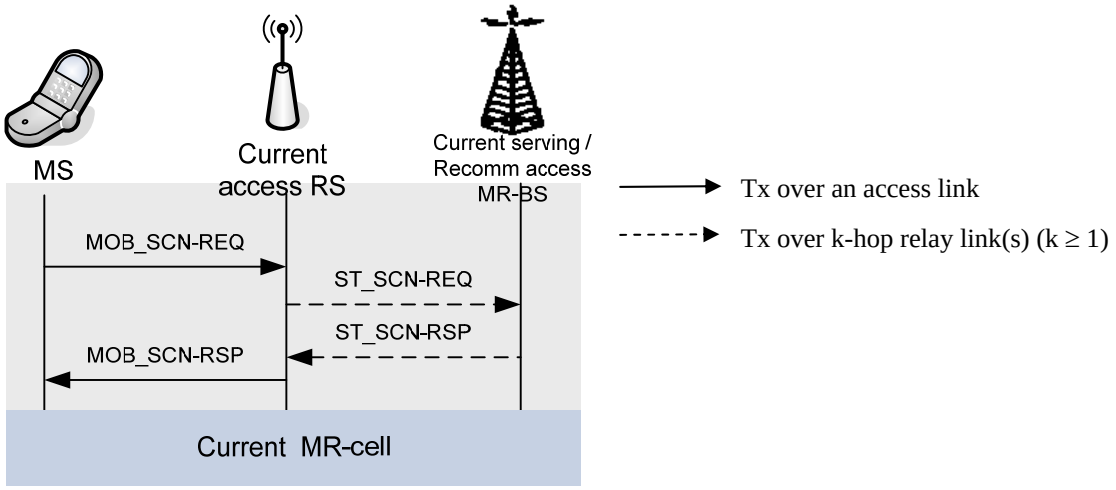
(b) when the recommended target is for Inter MR-BS handover

Recomm / Current	MR-BS in a different MR cell	RS in a different MR cell
MR-BS	Follows the procedure as defined in IEEE 802.16e-2005-2005	The current access MMS-BS and recommended RSs don't have knowledge of a relay path to reach each other because the RSs are under control of the different MR-BS. (1) The current access MR-BS transmits the request over the backbone destined to the serving MR-BS of the recommended access RS. (2) The serving MR-BS of the recommended access RS transmits a *ST_SCN-REQ* message to the recommended RS via k-hop (k≥1) relay

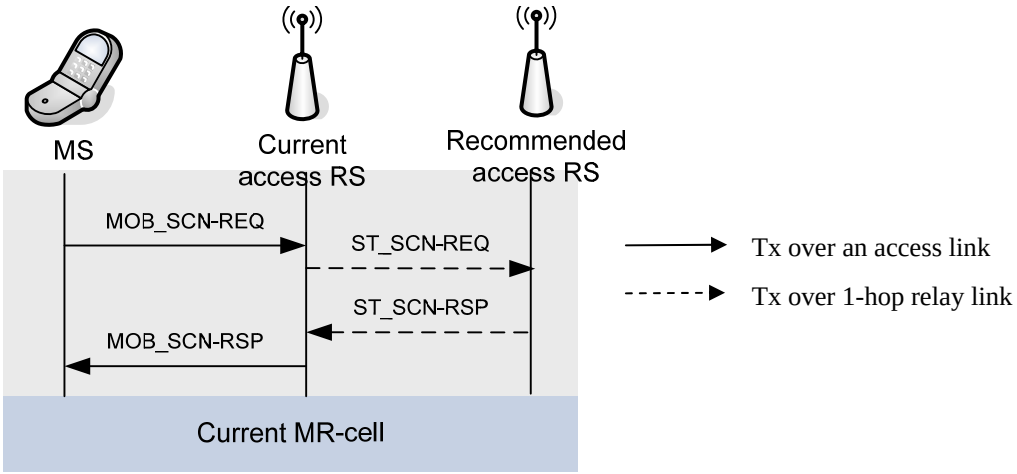
		path. (3) Upon receiving the request, the recommended RS transmits a *ST_SCN-RSP* message to its serving MR-BS. (4) The serving MR-BS of the recommended access RS responds to the current access MR-BS over the backbone. If the serving MR-BS of the recommended RS knows the allocation detail at the target access RS, steps (2) and (3) are skipped.
RS	The current access RS and the recommended MR-BSs don't have knowledge of a relay path to reach each other because the RS is not under control of the recommended MR-BS. (1) The current access RS issues a *ST_SCN-REQ* message destined to its serving MR-BS. (2) Upon receiving the request, the current serving MR-BS transmits the request over the backbone to obtain the information from the recommended MR-BS. (3) Upon receiving the response over the backbone, the serving MR-BS transmits the *ST_SCN-RSP* message to the current access RS.	Both RSs have a k-hop (k≥1) relay path to their serving MR-BSs. (1) The access RS issues a *ST_SCN-REQ* message destined to the current serving MR-BS. (2) Then, the current serving MR-BS forwards this request message to the target serving MR-BS over the backbone (3) The target serving MR-BS transmits the *ST_SCN-REQ* message to the recommended target access RS and receives a reply with a *ST_SCN-RSP* message from it. (4) Then, the target serving MR-BS replies to the current serving MR-BS and then the current serving MR-BS delivers the *ST_SCN-RSP* message to the current access RS. If the serving MR-BS of the target access RS knows the allocation detail at the recommended target access RS, step (3) is skipped.



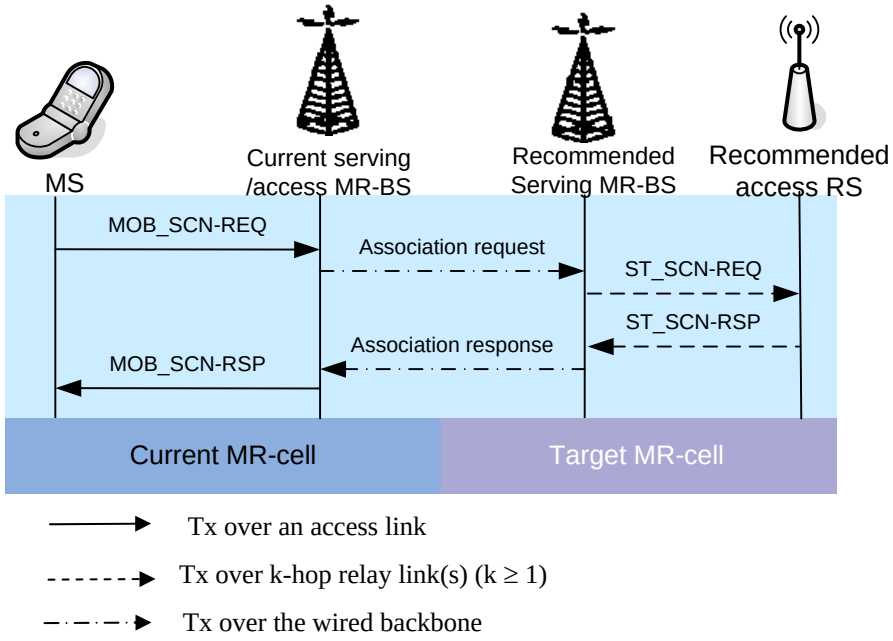
(a) Case1: Current access station is an MR-BS and recommended station is an RS in the same MR-cell. This is an example flow when the MR-BS does not know the recommended RS's ranging allocation detail for the MS.



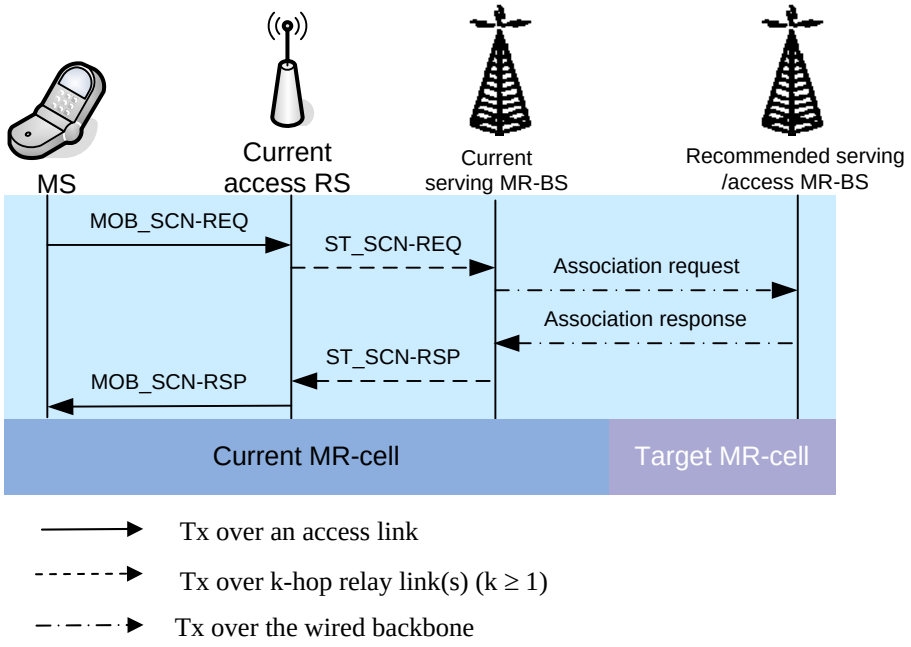
(b) Case2: Current access station is an RS and recommended station is serving an MR-BS in the same MR-cell



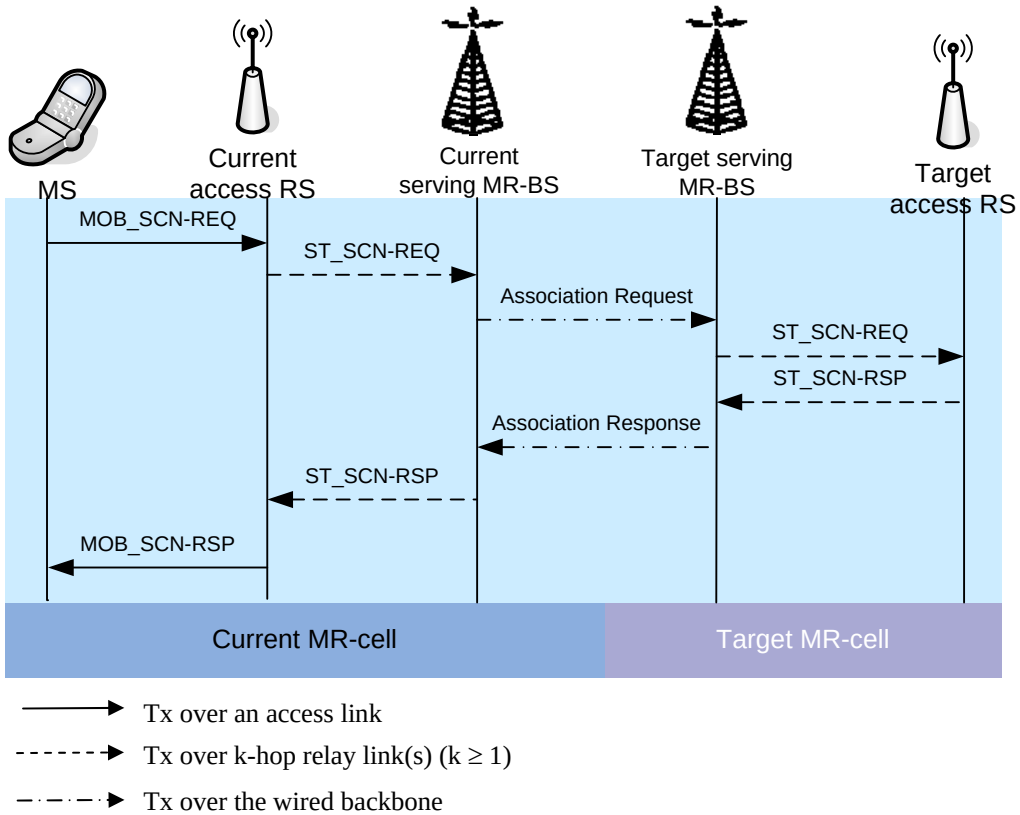
(c) Case3: Current access station is an RS and recommended station is another RS in the same MR cell. This flow is an example when a direct 1-hop relay link exists between the current and recommended access RSs.



(d) Case5: Current access station is an MR-BS and recommended station is an RS in a different MR-cell. This is an example flow when the MR-BS does not know the recommended RS's ranging allocation detail for the MS.



(e) Case6: Current access station is an RS and recommended station is an MR-BS in a different MR cell



(f) Case7: Current access station is an RS and recommended station is another RS in a different MR cell. This flow is an example when the MR-BS doesnot know the allocation detail the target access RS.

Figure 2. An example of signaling message exchanges for MS scanning (Other flows are

possible for each case.)

2.3 Cell Reselection

Cell reselection refers to the process where the MS determines a handover target through scanning and ranging. MS may use neighbor station information acquired from a decoded MOB_NBR-ADV message or may make a scanning request to perform cell reselection. MS cell reselection is processed according to 6.3.22.2.1 of IEEE 802.16e-2005. No change of this part is necessary for 802.16j networks.

3. Proposed Text

[Editor's note: Figure and table numbers are subject to change when the text is inserted into the amendment. The figures and tables appeared in the above sections will not be repeated in this section]

[Insert the following at the end of subclause 6.3.22.1.1]

For an MR network, an access station (i.e. MR-BS or RS) shall broadcast information about the network topology using the MOB_NBR-ADV message. An access station may obtain the access channel information of other infrastructure stations over the backbone and/or over the relay links. Since the objective of a MOB_NBR-ADV message is to aid in MS handover, the stations listed in a MOB_NBR-ADV message are potential target access stations recommended by the broadcasting access station for all MSs directly connected to it.

In a centralized MR network using simple RSs, an MR-BS owns all the information to generate a MOB_NBR-ADV message for every subordinate RS in its MR-Cell. In this case, an MR-BS generates an MOB_NBR-ADV message for individual simple RS and delivers this to it using primary CID between the MR-BS and the RS. Then, the RS simply broadcasts the received MOB_NBR-ADV message contents to its MSs. For this case, new messages are unnecessary.

On the other hand, depending on the capability of RSs in a hybrid or distributed MR system, an MR-BS is assumed to have some parameter values for its subordinate RSs but there might be other parameter values that each RS needs to inform the MR-BS. In this case, an RS informs the MR-BS of those parameter values by transmitting a NBR_ADV-INFO message using primary CID between the MR-BS and the RS. For example, if UCD configuration change is determined by an RS, the RS should update the MR-BS on UCD configuration change count value. In order to help RSs with obtaining the information to generate a MOB_NBR-ADV message, the MR-BS first determines a list of ISs in each subordinate RS's MOB_NBR-ADV. (The algorithm used to determine the list for each RS is out of scope for this proposal.) Next, the MR-BS transmits a NBR_ADV-INFO message to each subordinate RS including access channel information about the determined list of ISs for its MOB_NBR-ADV message. Whenever there is a change in terms of the member of IS list in a MOB_NBR-ADV message broadcasted by a particular RS or in terms of any parameter value of any IS in the list, the MR-BS transmits NBR_ADV-INFO to update the affected RSs.

As an alternative, depending on the capability of RSs, an RS is allowed to provide its upstream and downstream stations with its own access link information using a NBR_ADV-INFO message. Hence, RSs can collect the information from its upstream and downstream stations without using multi-hop path to the MR-BS. To obtain access link information for ISs that are not upstream or downstream station to the RS but are potential target access stations of MSs, the RS can send a NBR_ADVINFO-REQ message to the MR-BS with the identity of the ISs of interest. When an upstream RS receives the NBR_ADVINFO-REQ message from its

downstream RS, it reads Requested_Station_ID parameter to see if it owns the information of any requested ISs. If so, the upstream RS responds with a NBR_ADV INFO message to the downstream RS. Then, if there are other Requested_Station_ID(s) that it couldn't provided the information, it forwards the NBR_ADVINFO-REQ message to its upstream IS. Resultantly, if access link information of all the requested IS can be provided by intermediate RSs, the message doesn't have to be delivered to the MR-BS. This can reduce the communication overhead by reducing the size of the message and the number of the message forwarding. An RS may learn about which other ISs besides its upstream and downstream ISs might be potential target access stations for MSs in its coverage area by reading MOB_SCN-REP messages from the MSs.

The access station prepares a MOB_NBR-ADV message based on the information collected from the received *NBR_ADV-INFO* messages. Then, the access station transmits the MOB_NBR-ADV message to its associated MSs.

If a recommended station in a MOB_NBR-ADV message involves an Intra MR-BS handover, the bit numbers 0-7 of HO process optimization field in MOB_NBR-ADV are likely set to 1. Those values are used to indicate omission of some of network re-entry message exchanges including SBC-REQ message, PKM authentication messages, network address acquisition messages, time of day acquisition messages, and TFTP management messages as well as to enable full service/operational state transfer and post handover data forwarding.

[Insert new subclause 6.3.22.1.3.4]

6.3.22.1.3.4 Association in an MR network

Association levels 1 and 2 require coordination between the MS and the requested potential target access station. The coordination can be facilitated by the MS's current access station over the relay links as well as over the backbone. Two MAC management messages, i.e., *ST_SCN-REQ* and *ST_SCN-RSP* are used over the relay links for the coordination.

When the scanning type of a requested potential target access in the MOB_SCN-REQ message >=1, the following responses are possible:

- **Default**: Set "Scanning Type = 0" for the requested station in the MOB_SCN-RSP message.
- **Optional**: The access station may request coordination with the recommended station specified in the MOB_SCN-REQ message via an exchange of *ST_SCN-REQ* and *ST_SCN-RSP*. The procedure to exchange these messages can be found in Table 2 (a) and (b).

When association level 2 is chosen, the current access station needs to collect RNG-RSP from the potential target access station(s) that have received the CDMA ranging code from the MS, and then to transmit the aggregated RNG_RSP information to the MS using the MOB_ASC_REP message. In an MR network, RNG-RSP may be transmitted to the current access station over the relay links as well as the backbone.

[Editor's note: Include Table 2 here]

[Insert new subclause 6.3.2.3.xx]

6.3.2.3.XX NBR_ADVINFO-REQ

This message is used by an RS to make a request of access channel information of other ISs to the serving MR-BS. This message can be read by the intermediate RSs. The CID encoded in the

general MAC header is the primary CID between an RS and an MR-BS or between the requesting RS and its upstream RS.

Syntax	Size (bits)	Notes
NBR_ADVINFO-REQ_Message_format() {		
Management Message Type = TBD	TBD	
N_Requested_Stations		
For (i =0; i<N_Stations_Info; i++){	TBD	
Requested_Station ID	48	
Padding	TBD	Padding to reach byte boundary
}		
}		

[Insert new subclause 6.3.2.3.xx]

6.3.2.3.XX NBR_ADV-INFO

This message is used by an MR-BS or an RS to inform access link channel information over relay links.

Syntax	Size (bits)	Notes
NBR_ADV-INFO_Message_format() {		
Management Message Type = TBD	TBD	
N_Stations_Info		
For (i =0; i<N_Stations_Info; i++){	TBD	
Station ID	48	
Serving_MR-BS_indicator	1	If this parameter is set to 1, serving MR-BS ID of the RS of interest is included in the message.
If (Serving_MR-BS_indicator=1){		
Associated serving MR-BS ID	48	
}		
Action_Type	2	This parameter indicates that 0: Add (Add this station to the list for MOB_NBR-ADV message) 1: Remove (Remove this station from the list for MOB_NBR-ADV message) 2: Update (Update the information about this station) 3: Information (The information on the station is encoded in the message. But the action can be determined by the receiving station)
TLV encoded information		
}		
Padding	TBD	Padding to reach byte boundary
}		

The CID encoded in the general MAC header is the primary CID between an RS and an MR-BS or between the requesting RS and its upstream RS.

The following TLV parameters can be included whenever the value of the parameter is changed. The entire set of parameter values can be transmitted if necessary (.i.e., longer period or when a new RS(s) enters a network):

PHY Profile ID
The PHY Profile ID is the aggregate ID's including the Co-located FA Indicator bit, the FA Configuration indicator bit, Time/Frequency Synchronization Indicator, BS EIRP Indicator, DCD/UCD Reference Indicator, FA Index Indicator, and the FA (Frequency Assignment) number. For systems using OFDM or OFDMA, the bit-by-bit definition of the PHY Profile ID is shown in Table 108h.

FA Index
Only if the FA Index Indicator bit in the PHY Profile ID is set to 1, the FA Index follows the PHY Profile ID. In addition, if the FA Indicator is followed, the DL center frequency shall be omitted in the DCD/UCD difference TLV information. The bit-by-bit definition shall be determined by a service provider or a governmental body like FCC.

BS EIRP
The neighbor BS EIRP is listed in a signed integer form from –128 to 127 in units of dBm. The 'BS EIRP' field shall be omitted if the BS EIRP Indicator bit in PHY Profile ID is set zero.

HO Process Optimization
HO Process Optimization is provided as part of this message is indicative only. HO process requirements may change at time of actual HO. For each Bit location, a value of '0' indicates the associated reentry management messages shall be required, a value of '1' indicates the reentry management message may be omitted. Regardless of the HO Process Optimization TLV settings, the target BS may send unsolicited SBC-RSP and/ or REG-RSP management messages:

Bit #0: Omit SBC-REQ/RSP management messages during re-entry processing
Bit #1: Omit PKM Authentication phase except TEK phase during current re-entry processing
Bit #2: Omit PKM TEK creation phase during re-entry processing
Bit #3: Omit REG-REQ/RSP management during current re-entry processing
Bit #4: Omit Network Address Acquisition management messages during current reentry processing
Bit #5: Omit Time of Day Acquisition management messages during current reentry processing
Bit #6: Omit TFTP management messages during current re-entry processing
Bit #7: Full service and operational state transfer or sharing between serving BS and target BS (ARQ, timers, counters, MAC state machines, etc…)

Scheduling Service Supported
The Scheduling Service Supported field is present only if Bit #3 of Skip-optional-fields is 0. Bitmap to indicate if BS supports a particular scheduling service. 1 indicates support, 0 indicates not support:
Bit #0:Unsolicited Grant Service (UGS)
Bit #1:Real-time Polling Service (rtPS)
Bit #2:Non-real-time Polling service (nrtPS)

Bit #3:Best Effort
Bit #4:Extended real-time Polling Service (ertPS)
If the value of Bit #0 through #4 is 0b00000, it indicates no information on service available.

DCD Configuration Change Count
Represents the 4 LSBs of the Neighbor BS current DCD configuration change count.

UCD Configuration Change Count
Represents the 4 LSBs of the Neighbor BS current UCD configuration change count.
For each advertised Neighbor BS, the following TLV parameters may be included:

Mobility Feature Supported
Same as in 11.7.14.1.
When Mobility Feature Supported bit indicate support for idle mode, following TLV parameters may be included:

DCD_settings
The DCD_settings is a TLV value that encapsulates a DCD message (excluding the generic MAC header and CRC) that may be transmitted in the advertised BS downlink channel. This information is intended to enable fast synchronization of the MS with the advertised BS downlink. The DCD settings fields shall contain only neighbor's DCD TLV values that are different from the serving BS corresponding values. For values that are not included, the MS shall assume they are identical to the corresponding values of the serving BS. The duplicate TLV encoding parameters within a Neighbor BS shall not be included in DCD setting.

UCD_settings
The UCD_settings is a TLV value that encapsulates a UCD message (excluding the generic MAC header and CRC) that may be transmitted in the advertised BS downlink channel. This information is intended to enable fast synchronization of the MS with the advertised BS uplink. The UCD settings fields shall contain only neighbor's UCD TLV values that are different from the serving BS's corresponding values. For values that are not included, the MS shall assume they are identical to the serving BS's corresponding values. The duplicate TLV encoding within a Neighbor BS shall not be included in UCD setting.

PHY Mode ID (see 11.18.1)
a 16-bit value that specifies the PHY parameters, including channel bandwidth, FFT size, cyclic prefix, and frame duration.

[Insert new subclause 11.xx]

11.XX NBR_ADV-INFO Management Message Encoding

Name	Type (1bytes)	Length (bits)
PHY Profile ID	1	8
FA Index	2	8
BS EIRP	3	8
Preamble Index/ Subchannel Index	4	8
BS EIRP	5	8
Scheduling Service Supported	6	8

DCD Configuration Change Count	7	4
UCD Configuration Change Count	8	4
DCD_settings	9	variable
UCD_settings_	10	variable
Neighbor BS trigger	11	variable
PHY Mode ID	12	8

[Insert new subclause 6.3.2.3.xx]

6.3.2.3.XX ST_SCN-REQ

A current access station issues this message to negotiate the association level with a target access station and thus provide MSs with the appropriate scanning opportunity.

Syntax	Size (bits)	Notes
ST_SCN-REQ_Message_format() {		
Management Message Type = TBD	TBD	
Recommended station ID	48	
Current access station ID	48	
Requested MS ID	48	
Requested Scanning Type	3	
Padding	TBD	Padding to reach byte boundary
}		

[Insert new subclause 6.3.2.3.xx]

6.3.2.3.XX ST_SCN-RSP

This is a reply message to ST_SCN-REQ

Syntax	Size (bits)	Notes
ST_SCN-RSP_Message_format() {		
Management Message Type = TBD	TBD	
Recommended target station ID	48	
Current access station ID	48	
Associated MS ID	48	
Scanning Type	3	
If (Scanning type > 0){		
Rendezvous time	8	
CDMA_code	8	
Transmission_opportunity offset	8	
}		
Padding	TBD	Padding to reach byte boundary
}		

References

[1] IEEE C802.16j-06/217, “Overview of the proposal for MS MAC handover procedure in an MR Network,” Nov. 2006