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Title	Changes on inter-base station messages associated with handover	
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Re:	Task Group Review of IEEE802.16e-D1	
Abstract	This document contains suggestions to change the inter-base station messages associated with handover.	
Purpose	This document is submitted for review by 802.16e Working Group members	
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Changes on Inter-base station messages

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1. Problem Statement

This document suggest changes in TGe Draft Document IEEE 802.16e-D1 to provide the concept of multiple Service Flow for inter-base station messages in handover process.

As specified in TGe Draft Document IEEE 802.16e-D1, “In the initial Network Entry, Ranging and Hand-over processes, MSS shall request from the Target BS certain QoS levels **per Active Service Flow, differentiated by Service Class available for the Service Flow**”

Such a definition says that the MSS may have multiple Service Flows which are differentiated by Service Class. This means that each Service Flow is specified with its own QoS parameter set.

But, several inter-base station messages (HO-pre-notification, HO-pre-notification-response and HO-confirm) don't include the concept of multiple Service Flows in their parameters.

In detail, “Required BW/QoS” in HO-pre-notification message and “BW/QoS Estimated” in HO-pre-notification-response message represent QoS level of only one Service Flow.

Therefore, problems may exist as followings:

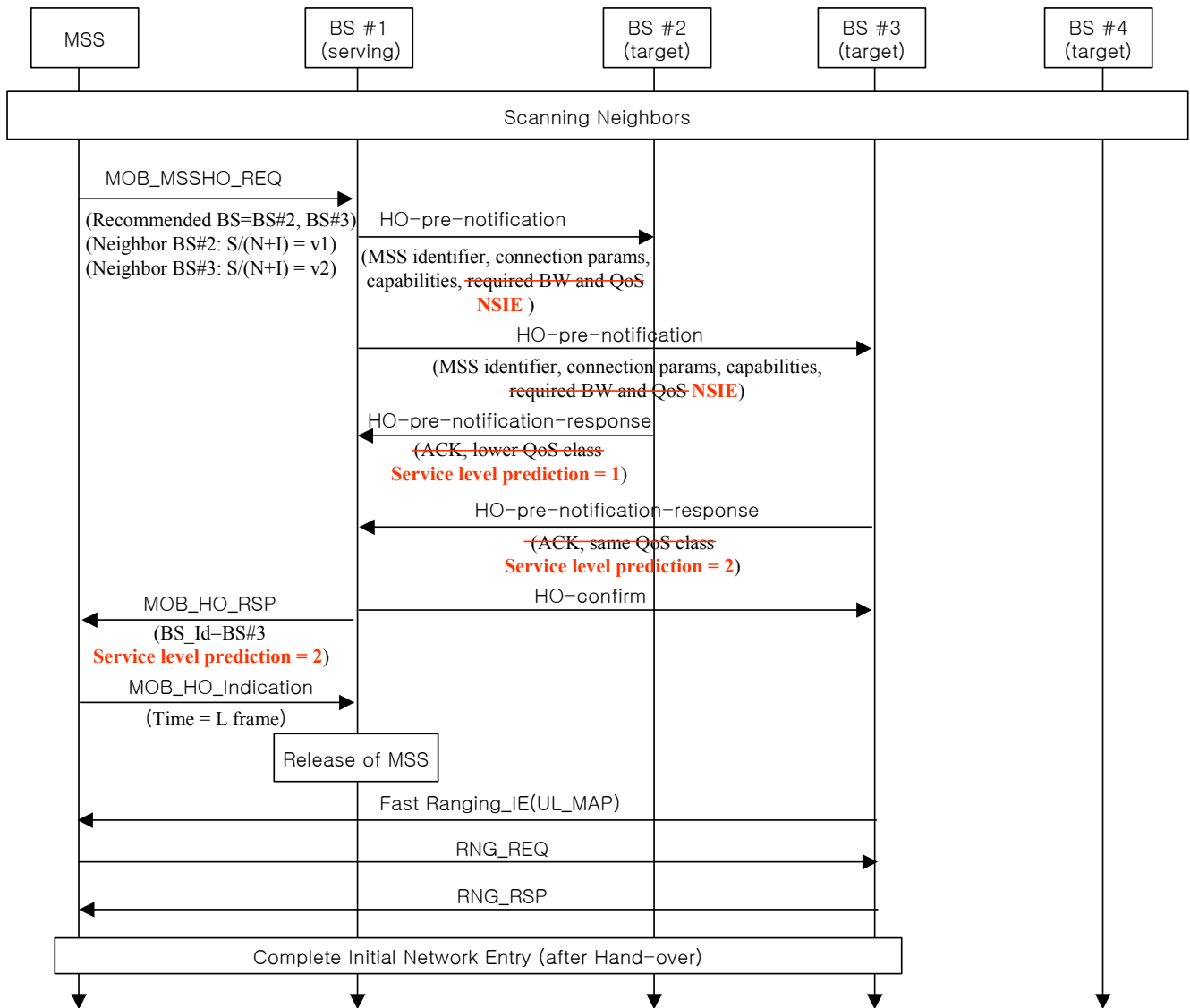
1. The Serving BS does not have any information to choose specific Service Flow that should be guaranteed for minimum bandwidth (Required BW/QoS) among multiple Service Flows.
2. “BW/QoS Estimated” and “ACK/NACK” from Target BS cannot provide Serving BS with enough information to decide the Service Level Prediction for MOB_BSHO_RSP message.

2. Proposed Remedy

For the purpose to solve the above problems,

1. We propose NSIEs (Network Service Information Element) in the HO-pre-notification message instead of Required BW/QoS parameters. NSIEs represent all Active Service Flow.
2. We also propose the Service Level Prediction parameter in HO-pre-notification-response instead of ACK/NACK indication.

The following figure-“HO process by MSS request” shows what the proposal is applied.



3. Specific Changes Suggested in TGe Draft Document IEEE P802.16e-D1

[Change Table C6 at page 72]

Table C6—HO-pre-notification Message

Field	Size	Notes
Global Header	152-bit	
For (j=0; j<Num Records; j++) {		
MSS unique identifier	48-bit	48-bit unique identifier used by MSS (as provided by the MSS or by the <i>I-am-host-of</i> message)
Estimated Time to HO	16-bit	In milliseconds, relative to the time stamp. A value of 0 indicates that the estimated time is unknown.
Required BW	8 bit	Bandwith which is required by MSS (to gurarantee minimum packet data transmission)
Required QoS	8 bit	Name of Service Class representing AuthorizedQoSParamSet
N_NSIE		Number of Network Service Information Elements
For (k=0; k<N_NSIE; k++) {		
Field Size	16-bit	Size of TLV encoded information field below
TLV encoded information	Variable	TLV information as allowed on a DSA-REQ MAC message
}		
}		
Security field	TBD	A means to authenticate this message
CRC field	32-bit	IEEE CRC-32

[Change Table C7 at page 73]

Table C7—HO-pre-notification-response Message

Field	Size	Notes
Global Header	152-bit	
For (j=0; j<Num Records; j++) {		
MSS unique identifier	48-bit	48-bit unique identifier used by MSS (as provided by the MSS or by the <i>I-am-host-of</i> message)
BW Estimated	8-bit	Bandwidth which is provided by BS (to guarantee minimum packet data transmission) TBD how to set this field
QoS Estimated	8-bit	Quality of Service level Unsolicted Grant Service (UGS) Real-time Polling Service (rtPS) Non-real-time Polling Service (nrtPS) Best Effort
ACK/NACK	8 bits	Acknowledgment or Negative acknowledgment 1 is Acknowledgement which means that the neighbor BS accepts the HO-pre-notification message from the Serving BS 0 is Negative acknowledgment which means that the neighbor BS may not accept the HO-pre-notification message from the Serving BS
Service level prediction	8 bits	Expected service level 0 = No service possible for this MSS 1 = Some service is available for one or several Service Flows authorized for the MSS. 2 = For each authorized Service Flow, a MAC connection can be established with QoS specified by the AuthorizedQoSParamSet. 3 = No service level prediction available.
}		
Security field	TBD	A means to authenticate this message
CRC field	32-bit	IEEE CRC-32

[Change Table C8 at page 74]

Table C8—HO-confirm Message

Field	Size	Notes
Global Header	152-bit	
For (j=0; j<Num Records; j++) {		
MSS unique identifier	48-bit	48-bit unique identifier used by MSS (as provided by the MSS or by the <i>I-am-host-of</i> message)
BW Estimated	8-bit	Bandwidth which is provided by BS (to guarantee minimum packet data transmission) TBD how to set this field
QoS Estimated	8-bit	Quality of Service level Unsolicited Grant Service (UGS) Real-time Polling Service (rtPS) Non-real-time Polling Service (nrtPS) Best Effort Service (BE)
}		
Security field	TBD	A means to authenticate this message
CRC field	32-bit	IEEE CRC-32