Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**New SAPs in the Convergence sub-layer**
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Re:	IEEE 802.16g-04/03-Call for Contribution on IEEE Project 802.16g
Abstract	To assist seamless fast L3 handover, new services between the MAC and higher layers are proposed.
Purpose	Discuss and adopt as the services between the MAC and higher layers.
Notice	
Release	
Patent Policy and Procedures	

New SAPs in the Convergence sub-layer

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1. Problem Statements

In order to maintain applications' sessions continuously whenever MSS moves into the different sub-network, the layer-3 handover scheme (Mobile IP, MIP) is necessary. Furthermore, to achieve as same quality service as defined in IEEE802.16 from the whole system point of view, enhanced L3-handover such as 'Fast mobile IPv6 (FMIPv6)' and 'Low latency handoffs in MIPv4' should be enabled and inter-worked appropriately at the same time. To support the enhanced handover schemes, which are usually deeply dependent on layer-2 (L2) services, some new services in MAC layer of IEEE802.16e are supposed to be defined.

In IEEE802.21, "A Generalized Model for Link Layer Triggers"[4], it defines a generalized trigger model which can provide abstraction for L2 triggers, and in IEEE 802.16e/D3 the services defined as SAP for higher layers protocols are provided by not the general but the specific MAC layer HO process. However, for MSS the events only after HO have been defined, such as 'BS Post-HO' and 'MSS Movement', while enough events for BSS during Mac HO process are defined, such as 'Serving/Target 'BS Pre-HO' and 'BS Post-HO', which are about both 'before' and 'after' HOs. Also since there is HO process by MSS request, which can give L2 trigger hint for the higher layers in MSS before HO, we should define new service indicating that MSS is about to handover to the target BSS. Therefore in this contribution, the new services in the Convergence sub-layer MAC layer (between the MAC and higher applications) are proposed.

2. Proposal

The pieces of information (parameters) that L3 fast handover schemes (FMIPv6) needs from the MAC layer HO are as following:

- Triggering indication that MSS is about to hand-over to a new BS: This information (indication) is used to trigger FMIPv6 operation at the layer-3.

- L-2 information of the detected neighboring BS: under FMIPv6, this information should be managed within MSS as a clue to identify/search the L-3 nodes corresponding to the target (candidate) BSs. Specifically, at least the 'selected BSs' among the set of the detected BSs in fig. 1 should be served for the higher application.

Consequently, this information is defined as new types of SAPs of the convergence sub-layer in the next section.

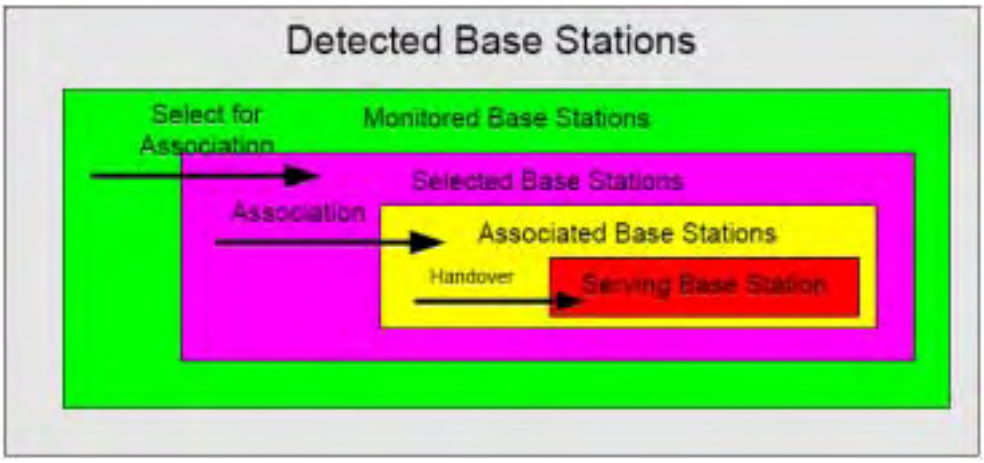

Fig 1. Sets of Neighbor BSs

3. Proposed Text Changes

[*Insert this section after the section D.4.2.5*]

D.4.2.6 MSS Pre-HO
Occurs at the MSS, indication that MSS is about to handover to the new target BS, specifically just after MSS issues MOB_MSSHO_REQ to the serving BS. The parameters in the following table shall be included in MSS-Pre-HO message.

Table 1 MSS-Pre-HO Message Format

Syntax	Size	Notes
MSS-Pre-HO () {		
SAP message type = ?	8 bits	To be assigned
Neighbor BS-ID	48 bits	48-bit universal MAC address of the target BS.
}		

D.4.2.7 MSS Neighbor-Set
Occurs at the MSS, information about BSs that Neighbor BSs are detected as a result of neighbor-scanning. The parameters in the following table shall be included in MSS-Neighbor-Set message.

Table 2 MSS-Neighbor-Set Message Format

Syntax	Size	Notes
MSS-Neighbor-Set () {		
SAP message type = ?	8 bits	to be assigned
N_NEIGHBORS	8bits	The number of detected BSs.
For (i=0 ; i<N_NEIGHBORS ; i++){		
Neighbor BS-ID	48 bits	48-bit universal MAC address of the detected neighboring BSs.
CINR		Measured signal quality.
}		

Reference

[1] IEEE P802.16e/D3, 31 May 2004 “Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems,”
[2] D. Johnson, et. al., “Mobility Support in IPv6,” rfc3775.
[3] Rajeev Koodli, “Fast Handovers for Mobile IPv6,” Internet Draft, draft-ietf-mipshop-fast-mipv6-01.txt Jan. 2004.
[4] Vivek G Gupta and David Johnston, “A Generalized Model for Link Layer Triggers,” IEEE802.21, Mar. 2004.