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Re:	IEEE P802.16e/D5
Abstract	KEY Update messages are defined to send keys from SS to BS after HO, HO process optimization TLV is updated to support partial authorization phase skipping after HO.
Purpose	Minimize authorization phase duration in network re-entry.
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Optimizing authorization phase during Handover

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Motivation

In order to achieve good mobility performance, the HO process should be as short as possible.
One of the main time-consuming phases in the network (re)entry is the authorization and key exchange phase.
If the SS will be able to skip or shorten this phase it will be a major step towards seamless HO.
This phase is composed of 2 sub-phases:

- The authentication phase which may be done before HO using pre-authentication
- The key (tek) exchange phase which there is no defined mechanism to skip over it.

The standard today gives the BS a way to inform the SS that the security phase can be skipped. However there may be situations that only one of the 2 sub-phases can be skipped and even this will shorten the total re-entry time.
This contribution describes the way to notify the SS toskip only one of the security sub-phases and a mechanism to be able to skip the key-exchange phase.

Proposed solution

The proposal is to define a new PKM-REQ/RSP MAC messages in which the SS can send all it's TEKs and their associated security context (keys lifetime etc…), TEK context will be a TLV in the message.
This message will be encrypted using the KEK of the SS-BS tupple which was established before this phase.
In addition the proposal adds a bit to the HO process optimization TLV (11.6) to separate the skip bit of the authentication and the key-exchange.

Changes summary

[Update the following in table 365a sec 11.6]

Name	Type	Length	Value
HO Process Optimization	nn	2	For each Bit location, a value of '0' indicates the associated re-entry management messages shall be required, a value of '1' indicates the re-entry 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 current re-entry processing Bit #1: Omit Authentication management messages during current re-entry processing Bit #2: Omit Key-Exchange management messages during current re-entry processing Bit #3 : Omit REG-REQ/RSP management during current reentry 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…) Bit #8 : post-HO re-entry MSS DL data pending at Target BS

Insert the following rows to table 26a in section 6.3.2.3.9]

Table 26a – PKM message codes

23	HO_TEK_SEND	PKM-REQ
24	HO_TEK_Confirm	PKM-RSP
25-255	reserved	

[Insert the following section in 6.3.2.3.9]

6.3.2.3.9.21 HO_TEK_SEND
Sent by the SS to the BS during network re-entry (after HO), if Key-Exchange should not be omitted (Bit #2 in the HO Process Optimization field).
This message contains a TLV for each SA with it's security context and also a Nonce.
All the message body is encrypted using KEK and signed with OMAC/HMAC which is the last attribute of the message.

Code: 23
Attributes are shown in Table 37k

Table 37k-HO_TEK_SEND attributes

Attribute		Contents
Nonce		A randomly generated bit string
	SAID	An SSID from the source BS as defined in 11.9.7

	TEK parameters for TEK0	The parameters of older TEK is SAID as defined in 11.9.8
	TEK parameters for TEK1	The parameters of newer TEK in SAID as defined in 11.9.8
HMAC/OMAC tupple		Cryptographic signature for this message

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6.3.2.3.9.22 HO_TEK_Confirm
Sent by the BS to the SS, as a response to the HO_TEK_SEND.
This message contains the same Nonce as in the HO_TEK_SEND encrypted with KEK.
This way the SS make sure the source of the confirmation is the BS.
All the message body is signed with OMAC/HMAC which is the last attribute of the message.

Code: 24
Attributes are shown in Table 37l

Table 37l-HO_TEK_Confirm attributes

Attribute	Contents
Nonce	A randomly generated bit string
HMAC/OMAC tupple	Cryptographic signature for this message