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Title	Fix some problems with Network Discovery and Selection, Global Roaming Support and Auth Policy negotiation for Initial Network Entry in network using NSP List
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Re:	IEEE 802.16 Session #48, draft P802.16g/D8
Abstract	Fix some problems with Network Discovery and Selection, Global Roaming Support and Auth Policy negotiation for Initial Network Entry in network using NSP List.
Purpose	Improve and correct P802.16g/D8 draft.
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Fix some problems with Network Discovery and Selection, Global Roaming Support and Auth Policy negotiation for Initial Network Entry in network using NSP List

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Problem 1:
During network detection and selection both when NSP ID list is used, and not, for MS that do not have subscription information/stored configuration information for detected operator networks, the base station only has the 3 byte Operator ID to present to the user for automatic and manual selection. This 3 byte Operator ID is not meaningful to a user for manual selection methods.

Presentation of a verbose text name for the Access Network /Network Service Provider (in 802.16 there is only the concept of the Operator, who is both the Access Network Operator and the Network Service Provide) will allow the user to identify the ASN/NSP provider and make decision to attempt hot-lining entry to gain subscription.

Create changes for IEEE 802.16g/D8 to add functionality to the air interface to support the mechanics and use of 'Verbose NSP Name List'. Modify use of SIQ TLV in SBC-REQ to allow for request for 'NSP List' only or 'NSP List' and 'Verbose NSP Name List'. Relocate the 'NSP Change Count' to the DCD to provide more ready decoding for faster determination and network entry.

Remedy 1:
In P802.16g/D8, in 6.3.2.3.24 SS basic capability response (SBC-RSP) message, page 16, line 23, modify the text as:

The following parameters ~~shall~~ may be included when solicited in the SBC-REQ message, unless there are no NSP ~~Ids~~ IDs to be included in the NSP List TLV, and unless the BS constructs and transmits an SII-ADV message including the NSP List TLV ~~and NSP Change Count TLV~~ contemporaneously with SBC-RSP:

NSP List (see 11.1.8.1)
~~**NSP Change Count (11.1.8.2)**~~
Verbose NSP Name List (see 11.1.8.2)
Verbose NSP Name List shall only be included in the message if NSP List TLV is also included in the message.

Remedy 2:
In P802.16g/D8, in 6.3.2.3.63 Service Identity Information (SII-ADV) message, page 18, line 20, modify the text as:

~~The following parameters SHALL be included the SII-ADV message:~~
~~**NSP List TLV (see 11.1.8.1)**~~
~~The NSP LIST TLV is a TLV that contains one or more Network Service Provider 24 bit Identifiers.~~
~~**NSP Change Count TLV (see 11.1.8.2)**~~
~~The NSP Change Count TLV indicates a change of the NSP list. It will be increased by one (module 256) whenever the NSP list changes.~~

The following parameters ~~MAY~~ may be included in the SII-ADV message; at least one TLV shall be included in an SII-ADV message:
NSP List TLV (see 11.1.8.1)

The NSP List TLV is a TLV that contains one or more Network Service Provider 24 bit Identifiers.

Verbose NSP Name List (see 11.1.8.2)

List of the verbose names of the NSPs. Verbose NSP Name List shall only be included in the message if NSP List TLV is also included in the message.

Query ID (11.1.9.4)

Query ID is returned by the BS in the PKM-RSP for the MS's Query request to indicate that a backbone query through NCMS is being carried out on behalf of the MS.

MIH Function frame type (11.1.9.2)

MIH Function frame type TLV indicates the service type of MIH Function Frame TLV

MIH Function frame (11.1.9.1)

MIH Function frame TLV is used to carry MIHF Frame received through C-MIH-IND primitive from NCMS.

Remedy 3:

In P802.16g/D8, in 11.1.8.2 NSP Change Count, page 29, line 25, delete the text and table as:

~~**11.1.8.2 NSP Change Count**~~

~~The NSP Change Count TLV indicates a change of the NSP list. Its value shall be increased by one (modulo 256) whenever the NSP list changes.~~

~~Name~~	~~Type~~	~~Length~~	~~Value~~	~~Scope~~
~~NSP Change Count TLV~~	~~139~~	~~1~~	~~Increment by one (modulo 256) whenever the list of the NSPs changes.~~	~~SBC-RSP, SII-ADV~~

Remedy 4:

In P802.16g/D8, in 11.4.1 DCD channel encoding, page 32, in Table 358, insert new row into table as:

Name	Type (1 byte)	Length	Value (variable length)	PHY scope
NSP Change Count TLV	56	1	The value of NSP Change Count is programmable. NSP Change Count is an incrementing value. A change in NSP Change Count signals to an SS that NSP List and/or Verbose NSP Name List has changed. Inclusion of the NSP Change Count is only required if the base station transmits NSP List TLV in any SBC-RSP or SII-ADV message.	All

Remedy 5:

In P802.16g/D8, in 11.1.8 NSP List encodings, page 29, line 44, insert text and table as:

11.1.8.2 Verbose NSP Name List

The Verbose NSP Name List is a compound list of the verbose names of the Network Service Provider as indicated by the NSP ID.

Name	Type	Length	Value	Scope

Verbose NSP Name List	139	*variable*	List of verbose names of the Network Service Provider(s). The value of Verbose NSP Name List is a compound list of verbose NSP name lengths and verbose NSP names. The order of the Verbose NSP Name Lengths and Verbose NSP Names presented in the Verbose NSP Name List TLV shall be in the same order as the NSP IDs presented in the NSP List TLV.	SBC-RSP, SII-ADV

Name	Type	Length	Value
Verbose NSP Name Length	139.1	1	Length of the Verbose NSP Name.
Verbose NSP Name	139.2	*variable*	The verbose name of the NSP. The Verbose NSP Name shall have the length as presented by the corresponding Verbose NSP Name Length

Remedy 6:

In P802.16g/D8, in 11.8.9 Service Information Query (SIQ) TLV, page 35, line 3, modify the table as:

Name	Type	Length	Value	Scope
SIQ	29	1	bit 0: indicates that the SS~~/MS~~ requests transmittal ~~queries~~ of the ~~Service Network Provider Identifiers~~NSP List TLV for the list of NSP IDs supported by the Operator Network that includes the current BS; bit 1: indicates that the SS requests transmittal of the Verbose NSP Name List TLV, in addition to the NSP List TLV; bit 1 shall not be set to a value of '1' unless bit 0 is also set to a value of '1' bit ~~1~~ 2 -7: reserved	SBC-REQ

Problem 2:
During network detection and selection when NSP ID list is used, the operator network does not have adequate information to formulate an appropriate SBC-RSP for the negotiated Auth Policy.
Specifically, unless the MS declares its destination NSP ID in SBC-REQ, the operator network does not know which VNSP policy to apply to determine effect on negotiated Auth Policy for that specific MS during that initial network entry event.
Additionally, the 802.16e-2005 standard provides that the Auth Policy information supplied by the MS during SBC-REQ is terminal capability only, and does not reflect the actual policy for the MS subscription at the HNSP. This information is inadequate for the operator network to make effective determination as to Auth Policy to enforce.
Also, the MS providing simple declaration of 'Single-EAP' can be inadequate as the operator network is unaware if the 'Single-EAP' is for Device Authorization or User Authorization. Without additional information, the operator network may inappropriately indicate for the MS to perform 'Double-EAP' when 'Single-EAP' is required. That is, if the MS policy at its HNSP is 'Single-EAP, Dev Auth', and the operator network Auth Policy is 'Dev Auth', then the operator network should enforce 'Single-EAP, Dev Auth' for the policy. But since the operator network does not know if the MS HNSP policy is for Dev auth or User Auth, the operator network may assume that the HNSP policy is for User Auth and proscribe 'Double-EAP'.
Finally, both for both when NSP ID list is used and not used, the MS cannot construct a properly decorated EAP Information Request without having the VNSP Realm.

Create changes for IEEE 802.16g/D8 to add functionality to the air interface to support the mechanics and use of 'Visited NSP ID' in SBC-REQ.

Create changes for IEEE 802.16g/D8 to add functionality to the air interface to support the mechanics and use of 'Auth Type for Single EAP' (Dev Auth/User Auth) in SBC-REQ.

Create changes for IEEE 802.16g/D8 to add functionality to the air interface to support the mechanics and use of 'Visited NSP Realm' in SBC-REQ.

Remedy 7:
In P802.16g/D8, in 6.3.2.3.23 SS basic capability request (SBC-REQ) message, page 15, line 6, modify the text as:
The following parameters may be included:

Capabilities for construction and transmission of MAC PDUs (see 11.8.2)
PKM flow control (see 11.7.8.6)
Authorization policy support (see 11.8.4.2)
Maximum number of supported security association (see 11.7.8.8)
Service Information Query (See 11.8.9)
Visited NSP ID (see 11.8.11)
Auth Type for Single EAP (see 11.8.12)

Remedy 8:
In P802.16g/D8, in 6.3.2.3.24 SS basic capability response (SBC-RSP) message, page 16, line 23, modify the text as:
The following parameters ~~shall~~ may be included when solicited in the SBC-REQ message, unless there are no NSP ~~Ids~~ IDs to be included in the NSP List TLV, and unless the BS constructs and transmits an SII-ADV

message including the NSP List TLV ~~and NSP Change Count TLV~~ contemporaneously with SBC-RSP:

NSP List (see 11.1.8.1)

~~**NSP Change Count (11.1.8.2)**~~

Verbose NSP Name List (see 11.1.8.2)

Verbose NSP Name List shall only be included in the message if NSP List TLV is also included in the message.

Visited NSP Realm (see 11.8.13)

Remedy 9:

In P802.16g/D8, in 11.8 SBC-REQ/RSP management message encodings, page 36, line 46, insert text and table as:

11.8.11 Visited NSP ID

When an MS attempts to connect to an operator network that is not the MS home network, and the roamed operator network has a relationship with the MS home network, and multiple Network Service Providers with differing AAA Services are available for authentication through the roamed operator network, the MS may include the Visited NSP ID in the SBC-REQ message to indicate to the roamed operator network which NSP the MS intends to be the conduit for authentication to the MS home network. If the BS requires the information provided by the Visited NSP ID in order to complete the initial network entry, and if the Visited NSP ID is not included in the SBC-REQ message, the BS may terminate the current attempt at initial network entry.

Name	Type	Length	Value	Scope
Visited NSP ID	180	3	NSP ID of the Network Service Provider the MS intends to be the conduit for authentication to the MS home network.	SBC-REQ

Remedy 10:

In P802.16g/D8, in 11.8 SBC-REQ/RSP management message encodings, page 36, line 47, insert text and table as:

11.8.12 Auth Type for Single EAP

Auth Type for Single EAP identifies the authorization type used in initial network entry when the authorization method is single EAP. Auth Type for Single EAP identifies the authorization type as either device authorization or user authorization.

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Name	Type	Length	Value	Scope
Auth Type for Single EAP	181	1	Auth Type for Single EAP shall only be included when bit#1 of MS Auth Policy support (see 11.8.4.2) has a value of '1'. Only one of the bit indicators, bit#0 or bit#1 of Auth Type for Single EAP, shall be set to a value of '1'. bit 0: device authentication bit 1: user authentication bit 2 -7: reserved	SBC-REQ

Remedy 11:

In P802.16g/D8, in 11.8 SBC-REQ/RSP management message encodings, page 36, line 48, insert text and table as:

11.8.13 Visited NSP Realm

When an MS attempts to connect to an operator network that is not the MS home network, and the roamed operator network has a relationship with the MS home network, and the MS authorization method is EAP, the BS may include the Visited NSP Realm in the SBC-RSP message to the MS to provide the realm of the AAA Services through which the MS intends to use to route the AAA messages for authentication to the MS home network. The MS may use the Visited NSP Realm to decorate an EAP NAI for the MS EAP transactions to its home network.

Name	Type	Length	Value	Scope
Visited NSP Realm	182	*variable*	Visited NSP Realm is a variable length string.	SBC-RSP