Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
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Re:	Call for technical proposals 802.16j-07/007r2
Abstract	This contribution provides a technical proposal for the RS network entry procedure. It is based on reusing many of the stages executed in the SS network entry procedure with the only major change being the introduction of new SBC TLV to enable exchange of information of key features supported by the RS.
Purpose	For discussion and approval of inclusion of the proposed text into the P802.16j baseline document.
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RS network entry procedure

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Introduction

This contribution provides a technical proposal for the network entry procedure to be followed by the MR-BS or RS to enable an RS to enter the MR enabled network.

The proposed procedure is based on reusing as much of the procedure currently defined in the IEEE Std. 802.16 for the purpose of SS network entry.

The current IEEE Std. 802.16 SS network entry procedure is illustrated in Figure 1 for reference.

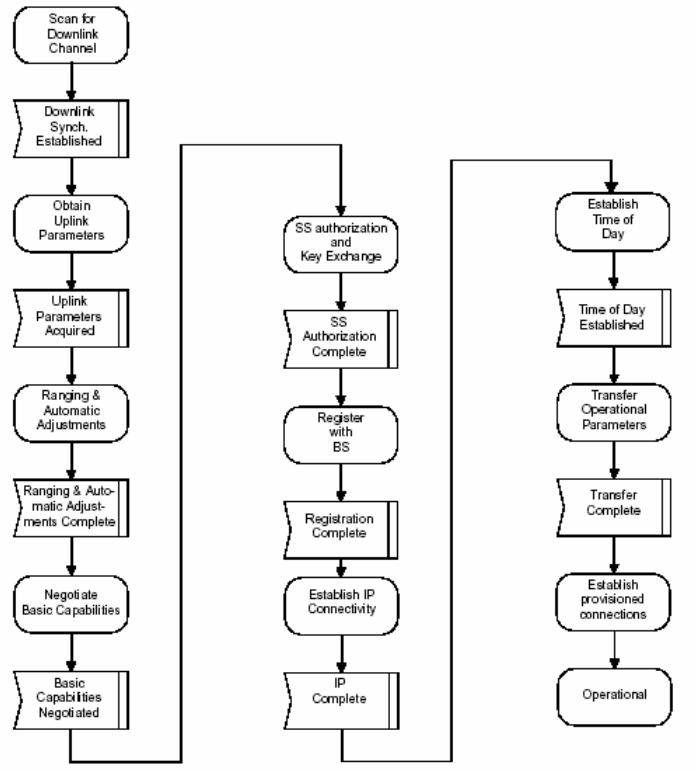

Figure 1. IEEE Std. 802.16 SS network entry procedure.

Overview of proposed procedure

It is assumed that the network could consist of some IEEE Std. 802.16 BS and some MR-BS. It is also assumed that a MR-BS may be operating in a legacy mode until it receives a request from an RS for it to enter the network. The reason the BS may operate in such a mode would be to preserve transmission resources.

However, it is proposed that the MR-BS will at least broadcast the MAC version support TLV [1] indicating its capability to support the IEEE 802.16j MAC in the DCD message. The RS will then be able to identify that the BS is in fact an MR-BS at an early stage in the network entry procedure and decide whether to continue once it learns whether it is attempting to connect to a BS or MR-BS.

The RNG process will be unchanged from the used for SS network entry, the only change being that the RS will indicate support of IEEE 802.16j through the MAC version support TLV. The MR-BS will respond indicating that it can support IEEE 802.16j.

Similarly in the SBC process, a new RS capability TLV are defined to indicate basic capabilities of the RS to the BS. This TLV will identify the type of relay (i.e. transparent, non-transparent, centralized scheduling, distributed scheduling) and also any other MR-BS or RS related features required to support the RS. This TLV is defined in this proposal. By placing it in SBC it allows the RS to abort connection if it finds that fundamental basic parameters are not supported.

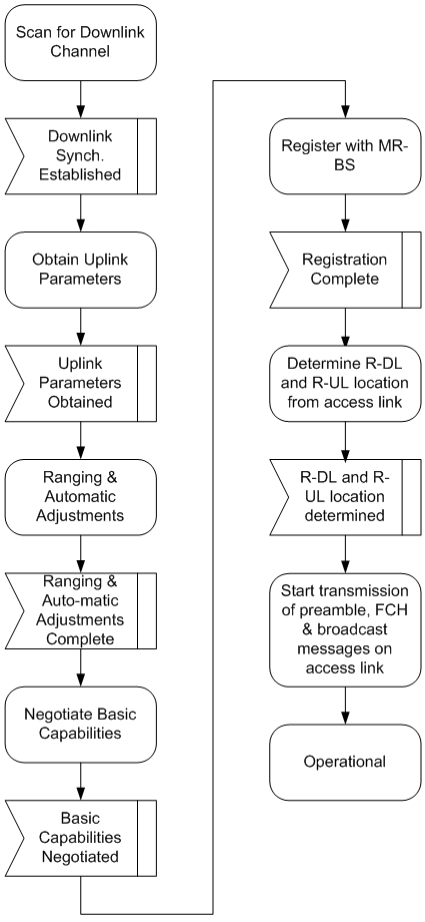

Figure 2. RS network entry procedure.

Proposed text changes

6.3.2.3.23 SS and RS Basic Capability Request (SBC-REQ) message

[Change the text in the first paragraph as indicated:]

The SS SBC-REQ shall be transmitted by the SS or RS during initialization. An SS or RS shall generate SBC-REQ messages in the form shown in Table 51.

[Insert the following text at the end of 6.3.2.3.23:]
An RS shall generate SBC-REQs including the following parameter:

> **Basic CID** *(in the MAC Header)*
> The CID in the MAC Header is the Basic CID for this RS, as assigned in the RNG-RSP message.

All other parameters are coded as TLV tuples.

Basic Capability Requests contain those RS Capabilities Encodings (11.8) that are necessary for effective communication with the RS during the remainder of the initialization protocols. Only the following parameters shall be included in the Basic Capabilities Request:

> **Physical Parameters Supported** (see 11.8.3)
> **Bandwidth Allocation Support** (see 11.8.1)

6.3.2.3.24 SS or RS Basic Capability Response (SBC-RSP) message

[Insert the following text before the last sentence:]
An MR-BS shall generate SBC-RSPs in the form shown in Table 52, including both of the following parameters:

> **CID** *(in the MAC Header)*
> The CID in the MAC Header is the Basic CID for this RS, as appears in the RNG-REQ message.

The following parameters shall be included in the SBC-RSP if found in the RS SBC-REQ:

> **Physical Parameters Supported** (see 11.8.3)
> **Bandwidth Allocation Support** (see 11.8.1)
> The MR-BS response to the subset of RS capabilities present in the SBC-REQ message. The MR-BS responds to the RS capabilities to indicate whether they may be used. If the MR-BS does not recognize an RS capability, it may return this as “off” in the SBC-RSP.

Only capabilities set to “on” in the SBC-REQ may be set “on” in the SBC-RSP, as this is the handshake indicating that they have been successfully negotiated.

6.3.9 Network entry and initialization

[Change the first paragraph as indicated:]

Systems shall support the applicable procedures for entering and registering a new SS or RS or a new node to the network. All network entry procedures described hereunder through and including 6.3.9.13 apply only to PMP operation and PMP operation with MR support. The network entry procedure for Mesh operation is described in 6.3.9.14.

[Insert the following text after the second paragraph:]

The procedure for initialization of an RS shall be as shown in Figure 55. For the RS the stages g), h), i) and j) are not required, for all other stages the RS shall behave in the same manner as an SS during network entry unless otherwise specified in the subclauses of 6.3.9. The more detailed finite state machine representations of the individual sections (including error paths) and the timeout values shall be the same as those provided for the SS, unless otherwise specified.

Change the table in subclause 11.1.3 as indicated:

Type	Length	Value	Scope
148	1	Version number of IEEE 802.16 supported on this channel. 1: Indicates conformance with IEEE Std 802.16-2001 2: Indicates conformance with IEEE Std 802.16c-2002 and its predecessors 3: Indicates conformance with IEEE Std 802.16a-2003 and its predecessors 4: Indicates conformance with IEEE Std 802.16-2004 5: Indicates conformance with IEEE Std 802.16-2004 and IEEE Std 802.16e-2005 6: Indicates conformance with IEEE Std 802.16-2004, IEEE Std 802.16e-2005 and IEEE Std 802.16j-xxxx ~~6~~7-255: *Reserved*	PMP: DCD, RNG-REQ MESH: REG-REQ, REG-RSP

[Insert new subclause 11.8.3.8:]

11.8.3.8 MR specific parameters

[Insert the following text:]

This TLV indicates the MR features supported by the RS and MR-BS.

Type	Length	Value	Scope
TBA	1	Bit #0: Access zone preamble transmission support Bit #1: RS scheduling support Bit #2: NBR-ADV generating Bit #3: Tunneling support Bit #4: RS mobility support Bit #5: Child RS network entry support Bit #6-7 : *Reserved*	SBC-REQ SBC-RSP

References

[1] Hart, M., “MAC version encoding TLV for .16j”, IEEE C802.16j-06/139, IEEE 802.16 meeting #46, Dallas, November 2006.