Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Evaluation Criteria for Frame Structure, Timing and Synchronization (Contribution to IEEE802.16.3)**
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Source(s)	Anader Benyamin-Seeyar Harris Corporation Inc. 3 Hotel de Ville Dollard-des-Ormeaux, Quebec, Canada, H9B 3G4 Voice: +1 514 822 2014 Fax: +1 514 421 3756 mailto:abenyami@harris.com
Re:	IEEE802.16.3-00/07r1 document. Response to "802.16.3 Invitation for Contribute" on Evaluation Criteria for the list of Key Characteristics of the Sub-11 Air interface for Session #9.
Abstract	This document presents a list of evaluation criteria by which the Key characteristics that were established by the 802.16.3 Task Group by the end of Session #8.
Purpose	This contribution will be presented and discussed within the Task Group in Session #9 for possible adoption for technical assessment of various Frame Structure, Timing and Synchronization schemes.
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Evaluation Criteria for Frame Structure, Timing and Synchronization Schemes

Anader Benyamin-Seeyar
Harris Corporation Inc.

Introduction:

The suggested Frame Structure, Timing and Synchronization schemes by the Task Group in Session #8. Comparisons of various Frame Structure, Timing and Synchronization schemes have to be based on the applicability, lower complexity, and reduced cost factors for the services and the market that is identified within the Functional Requirement Document (IEEE 802.16.3-00/02r3). In order to perform a thorough assessment of the above list of duplex schemes, we propose to verify the following evaluation criteria on each of selected scheme:

The evaluation criteria for Frame Structure and Timing and Synchronization will be directly depended on the selection of Access technique and FDD/TDD schemes and they should evaluated based on the following factors:

- Channel efficiency (minimal overhead requirements)
- Carrier recovery complexity
- Timing accuracy requirements
- Based on selected access protocol and dynamic channel allocation, define and evaluate the channel efficiency
- Performance:
    - Frame size (e.g., in msec.)
    - Overall data rate
    - Total no. of users supported (max no. of simultaneous user access) per Base Station
    - Max no. of time slots or mini-slots per frame
    - No of frames within Multi-frame,…
    - Delay factor
    - Jitter factor.

- Synchronization efficiency and complexity (in burst or in continuous transmission modes)
- Frequency agility in both directions; Upstream and Downstream
- Implementation complexity and its economical factor.

Note that the above evaluation criteria list can be similar to the list given for the evaluation of duplex techniques.

The above list of evaluation factors is important to assess for each frame structure and timing and synchronization schemes in order to evaluate their applicability, technical effectiveness, performance, and their economical benefits of one against others.

How to apply the above evaluation Criteria:

Most of the factors mentioned above can be assessed by compiling what we know about each of these frame structure, timing and synchronization schemes and will require the application of simulation methods to evaluate the performance related factors.

Based on list of services and types of traffic that are specified within the Functional Requirement Document, the input traffic can be modeled. An End-to-End network simulation can be implemented. Then, each of frame structure shall be modeled and individually generate their system throughput and delay, and other performance factors for the evaluation purposes.

There shall be further analysis be done for the evaluation of the End-to-End network delay.

In addition, based on past experiences on implementation complexity, synchronization difficulty, we shall compile all the pros and cons of each duplex scheme. Of course, each of above assessment criteria can have different weighting (to be determined) for a final conclusion on frame structure.