

## Proposal to Add Point-to-Point Option to IEEE 802.16™ MAC

### IEEE 802.16 Presentation Submission Template (Rev. 8.3)

Document Number:

IEEE S802.16-03/11

Date Submitted:

2003-07-28

Source:

Kenneth Stanwood  
Ensemble Communications, Inc.  
9890 Towne Centre Dr.  
San Diego, CA 92121

Voice: +1 858 404 6559  
Fax: +1 858 638 7142  
E-mail: <mailto:ken@ensemble.com>

Roger B. Marks  
NIST  
325 Broadway, MC 813.00  
Boulder, CO 80305

Voice: +1 303 497 3037  
Fax: +1 509 756 2642  
E-mail: <mailto:marks@nist.gov>

Venue:

IEEE 802.16 Working Group Session #26 meeting: Proposed New Concepts

Base Document:

IEEE C802.16-03/11

Purpose:

To stimulate Working Group thinking on this topic, and to prepare the groundwork for developing a point-to-point option at the next opportunity, such as during the next Revision of IEEE Standard 802.16.

Notice:

This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

Release:

The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.

IEEE 802.16 Patent Policy:

The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures <<http://ieee802.org/16/ipr/patents/policy.html>>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <<mailto:chair@wirelessman.org>> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <<http://ieee802.org/16/ipr/patents/notices>>.

Proposal to Add a Point to Point Option to  
IEEE 802.16

Ken Stanwood  
and  
Roger Marks

# Classical PtP

- FDD
- Fixed Symmetry
  - Origins from era of symmetric TDM services
- PHY parameters fixed
  - Function of environmental conditions (e.g., rain region)
  - Function of availability goals (e.g. 99.995%)

## Result of Classic PtP

- Fixed bandwidth availability – all or 0
- Typically sized to ensure bandwidth availability
- No QoS concerns
- Worst case parameterization creates waste

# Features of IEEE 802.16 that can Enhance PtP

- Adaptive PHY
  - Reduce bandwidth rather than drop link during harsh conditions
  - Typically more bandwidth than “planned” to meet availability
- Statistical multiplexing of bursty traffic
  - Requires QoS
- TDD as an option
  - Can statistically multiplex UL and DL

## PtP in IEEE 802.16

- Currently trivial PtP link allowed
  - 1 SS on a channel
- PtP links have some advantages to PMP links
  - Lower delay
  - Lower overhead
    - No need for bandwidth requests

# Potential Mods to IEEE 802.16 to Increase PtP Efficiency

- Have bit/field in FCH to indicate current PtP operation
- When in PtP mode, no need for BW requests
  - SS gets all UL
  - TDD split can be based on utilization
- Can still have Ranging opportunities
  - Initial link startup
  - Transition from PtP to PMP