Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**System Profiles**
Date Submitted	**2001-03-08**
Source(s)	Ken Stanwood Ensemble Communications 9890 Towne Centre Dr. San Diego, CA 92121 Voice: (858) 404-6559 Fax: (858) 638-7142 mailto: ken@ensemblecom.com
Re:	Letter Ballot #3
Abstract	Text for a section on system profiles.
Purpose	Allow reduced scope, yet still standards compliant systems
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 text 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.
Patent Policy and Procedures	The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures (Version 1.0) <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, if there is technical justification in the opinion of the standards-developing committee and provided the IEEE receives assurance from the patent holder that it will license applicants under reasonable terms and conditions for the purpose of implementing 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:r.b.marks@ieee.org> as early as possible, in written or electronic form, of any patents (granted or under application) that may cover technology that is under consideration by or has been approved by IEEE 802.16. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/notices>.

System Profiles

Ken Stanwood
Ensemble Communications

Background

The 802.16 *Draft Air Interface Specification for Fixed Broadband Wireless Access Systems* is evolving to cover a wide range of possibilities, from systems carrying predominantly ATM traffic to systems carrying predominantly IP traffic, and from systems with wide channels at high frequencies to systems with narrower channels at lower frequencies. This causes the specification to contain a plethora of features. This overabundance of features causes 2 main problems for implementers of standards compliant systems.

First, is the issue of what is mandatory versus optional. This question does not have a clear cut answer. For instance, it may be obvious that it is mandatory to support the convergence sublayer for the user data a system is carrying. But, due to system differences, it is not obvious that there is any one particular convergence sublayer that is mandatory (with the exception of enough of the packet sublayer to implement the secondary management connections). It would be reasonable for devices for a system that is IP based to not implement the ATM convergence sublayer if they are being sold to a market that will never see ATM cells. Similarly, it would be reasonable for an ATM system to not be required to implement the VLAN portion of the packet convergence sublayer. Similar issues arise in the physical layer. If devices are designed for PHY mode B with 20 MHz channels they need not be required to also work with 28 MHz channels.

The second issue arises from the first. If it is accepted that the set of mandatory versus optional features is situationally dependent, then there must be a concise method of specifying which situation a device was designed to accommodate, i.e., which feature set is implemented.

The concept of system profiles, actually pairs of profiles for the convergence sublayer and the physical layer, solves both of these problems. First it defines the set of mandatory and optional features for a given situation. Second, it guarantees interoperability by ensuring that multiple devices, from any combination of vendors, will interoperate if they have implemented the same profiles.

The following section gives text for a profile section to be added to the 802.16 air interface specification, as well as a first convergence sublayer profile.

Text for New Document Section

The following text should be inserted on page 376, line 32 as a new section.

x. System Profiles

This section defines system profiles. There are two categories of profiles, those dealing with the convergence sublayer features and functions, and those dealing with physical layer features and functions. Unless otherwise stated, any convergence sublayer profile may be combined with any physical layer profile.

x.1. Convergence Sublayer Profiles

Convergence sublayer profiles define the mandatory and optional features for the convergence sublayer aspects of a system intended for a particular networking scenario.

x.1.1. Basic ATM System Profile

The basic ATM system profile is intended to address the requirements of a basic ATM interfacing to an ATM backhaul on the BS side and carrying ATM cells across the air interface between the BS and SSs. It differs from a full implementation of ATM in that it assumes all data is carried in VC-switched PVCs. As such, it has the following feature sets.

For the convergence sublayers:

- PVCs are mandatory, SVCs and soft PVCs (i.e., ATM signaling support) are optional.
- VC-switched connections are mandatory, VP-switched connections are optional.
- ATM payload header suppression is mandatory as a capability, but may be turned on or off on a per connection basis.
- Only enough of the packet convergence sublayer need be implemented to support the secondary management channel.

For the MAC layer itself:

- Packing of multiple ATM cells into a single MAC PDU is mandatory as a capability, but may be truned on or off on a per connection basis.
- Fragmentation of SDUs on ATM traffic connections is not required although fragmentation on the primary and secondary management channels is still required. (Note that fragmentation and packing on the same ATM connection requires that the ATM connection be treated as a variable length packet connection.)
- ARQ is optional.
- MAC layer CRC is optional.

x.2. Physical Layer Profiles

Physical layer profiles define the mandatory and optional features for the physical layer aspects of a system intended for a particular channel scenario.

x.2.1. Profiles for 10-66 GHz PHY

For future study.