Project	IEEE 802.16 Broadband Wireless Access Working Group
Title	IDU/ODU (IF) Interface Committee Report and Recommendation
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Re:	In response to a IEEE 806.16 Study Group Request Arising Out of the Boulder September1999 Meeting
Abstract	This document provides a review of the issues faced in the development of an IDU/ODU (IF) Interface Standard and provides a recommendation for consideration by IEEE802.16 as to moving forward with standards related issues associated with this area.
Purpose	This document is intended to inform IEEE 802.16 Study Group Member of the issues surrounding standardization of the ODU/IDU Interface, provide a discussion and make a recommendation.
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IDU/ODU(IF) Inteface Committee Report

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The Issues

At the last IEEE 802.16 meeting in Boulder, CO, USA, the topic of IDU/ODU Interface standardization was debated from the perspective of the benefits of having and of not having an interface standard for the Broadband Wireless Access(BWA) Industry.

Arguments in favor of NOT having an Interface Standard were as follows:

- The convergence of analog systems into digital systems is a trend that has overtaken many of our current analog systems and the suggestion is this will also occur in the BWA industry. The implication is the technology will naturally migrate so that common high speed interfaces such as 100BaseT will be connected to a combined ODU/ODU unit with LAN type hub and routing configurations to distribute the signals around a local networked distribution environment. Therefore, if the industry is naturally evolving to a point where no ODU/IDU Interface will be required then there is no need to create a standard interface at this point in the system.

- The resources of the IEEE 802.16 Working Group are currently strained to manage four concurrent task groups and the addition of another parallel task groups will be difficult to manage for the members resulting in the defocusing our current efforts.

Arguments in favor of having an Interface Standard were as follows:

- Large-scale consumer adoption of technology has historically been preceded by defining the physical, electrical and communication interfaces between interior units and exterior networks or devices. Common examples for various industries include the wall jack, electrical and signaling interfaces for telephone and fax, the air interface for cellular and wireless LAN's, the spectral, cable and connector interface for cablevision, the spectral, connector and electrical interface for the satellite broadcast reception and the electrical outlet for the power industry.

- In a related area, the definition of the Digital and MAC interfaces in the IEEE 802.11 standard proved very beneficial for companies operating in the wireless LAN industry since the vendors were able to claim their products and other system components could be second sourced through competitors.

- The placement of a combined ODU/IDU on the roof with a digital interface is an engineering challenge for Subscriber Transceiver Stations with respect to extending high speed data connectivity such as 100BaseT into outdoor environments and with respect to extending the indoor 0 to +50 degree Centigrade environmental specifications to an outdoor –50 to +65 degrees Centigrade environmental specification.

Discussion

The digital convergence argument is compelling and may ultimately be true, however, the current state of technology for many of the industry suppliers will necessitate separate solutions today for the IDU and ODU due to practical considerations. These considerations are technical in that having

all the active components in one combined exterior mounted solution will not be the optimum solution for many vendors today due to engineering considerations and for some applications is not the best topology especially where the digital link to the tower or building top exceeds the comfortable limit of 100 feet for standard 100 BaseT. Therefore, there are strong reasons to develop a standard that will allow options for both combined and separate ODU and IDU solutions. Should a separate ODU and IDU solution be a technological necessary evolutionary step, as a minimum there should be working practices to address problems that are inherent to the ingress of interfering signals into the system from high-level signals in the operating environment. There also needs to be a mechanism to provide power control on the link to ensure coexistence with other systems and to overcome rain fade. This is an interdependent function between the ODU and IDU and implies that some form of telemetry and control signals are required for the two units to coordinate their efficient operation within a BWA system as network elements. In the development of the IEEE 802.16 standard these aspects of the ODU/IDU Interface still need to be coordinated for the best standards result.

On one hand the industry does not want to be constrained in its pursuit of improved solutions but on the other hand large-scale adoption will occur best when the physical, electrical and communications interfaces are well defined. At this moment the group has yet to make critical decisions with respect to the PHY and MAC that will in turn define how some of the fundamental elements of an IDU/ODU interface can take shape. Defining an ODU/ODU standard too early will constrain flexibility in setting the MAC and PHY aspects of the standard and therefore these should be decided first.

Recommendations

In order to gain maximum industry benefit without imposing constraints on the IEEE 802.16 Study group in the development of a BWA standard, the IDU/ODU (IF) Interface Committee proposes the following recommendation for consideration:

- The committee recommends that any specific standards effort relating to the IDU/ODU (IF) Interface not be a parallel task but rather a subsequent task after the MAC & PHY task groups have made their critical decisions. A subsequent IDU/ODU standards effort should then proceed if a significant industry component requires separate ODU & IDU units to implement Subscriber Transceiver Station solutions. Given adequate consensus, this effort should then proceed under a separate PAR, build on the previous task group work and have the purpose to promote widespread adoption.

- The committee also recommends that in the interim the IDU/ODU (IF) Interface issues be integrated into the existing working groups to the extent possible under their existing scope and be expanded if necessary. This would imply that Power Control issue be addressed by the PHY Task Group and issues centered on IF interference issues be dealt with as part of the working practice document being prepared by the Coexistence Task Group. The area of the telemetry and control signals and definition of a physical interface may fall outside the current task group efforts but the committee encourages members to find ways to incorporate these aspects within the current work of IEEE 802.16.

- The committee recommends another review to reassess standardization issues surrounding the ODU/IDU (IF) Interface in one year's time.