Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Corrections to QoS parameter text**
Date Submitted	**2004-8-18**
Source(s)	Jeff Mandin Voice: 972-50-724-587 Streetwaves Networking Fax: 972-50-724-587 Amatzia 5 mailto:jeff@streetwaves-networks.com Jerusalem, Israel
Re:	Corrigenda call for contributions
Abstract	Corrections to QoS Parameter Text
Purpose	Adoption and inclusion in 802.16d corrigenda
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.
Patent Policy and Procedures	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>.

Corrections to QoS parameters text
Jeff Mandin
Streetwaves Networking

1   Justifications for changes

1. Maximum Sustained Traffic Rate

There is ambiguity regarding at what point (ie. where in the logical stack) the traffic rate should be measured for the purpose of limiting the rate (ingress to BS or SS? before PHS? After PHS?).

There is ambiguity regarding which MAC overhead is not counted (ie. we should emphasize that MAC headers are included when they are part of the SDU eg. with 802.3-style convergence sublayer).

The statement that the instantaneous rate of the service is limited by the rate of the ingress port is plain wrong. Similarly, the statement that policing needs to be done on the uplink only and not the downlink is nonsensical, and conflicts with main body of the QoS text (in section 6).

There is ambiguity regarding what is done with SDUs that exceed the Maximum Sustained Traffic Rate (ie we should say that "you drop them or queue them, it's up to the vendor").

There is inconsistency with the main QoS text in 6.3.5.2.1 which states that this parameter is used to calculate the time between grants for UL-UGS service (ie. we should say that here).

2. Maximum Traffic Burst

The intent of the description of this parameter is not clear. Moreover, it is not mentioned in the main QoS text at all. The parameter appears to be a vestige from DOCSIS, where it specifies a value used in the Max Sustained Rate algorithm.

This is not consistent with our text, which says that the algorithm for enforcing Max Sustained Rate is unspecified. Hence the parameter should be deleted.

3. Minimum Reserved Traffic Rate

The statement that the service flow's less-than-reserved-rate available data "should be transmitted as soon as possible" is nonsensical and should be deleted.

The main text formerly said that the aggregate for minimum reserved rates could exceed the actual link rate. But this was deleted from the main text and should be deleted from here too, for consistency.

The parameter description only addresses uplink scheduling, even though the main text applies the parameter to downlink scheduling. For consistency, the parameter description must apply to both uplink and downlink.

4. Maximum Delay

There is nowhere in the document where a parameter is imposed that applies outside the MAC or PHY. Hence the measuring of Maximum Latency begins at "reception on a network interface" is an error (probably a vestige from DOCSIS) and should be corrected to refer to ingress at the CS.

2 Text Changes

[Modify 11.13.7 as follows:]

11.13.7 Maximum sustained traffic rate

This parameter defines the peak information rate of the service. The rate is expressed in bits per second and pertains to the SDUs at the input to the Convergence Sublayer ~~system~~. Hence ~~Explicitly~~, this parameter does not include 802.16 MAC overhead such as MAC headers or CRCs. ~~This parameter does not limit the instantaneous rate of the service since this is governed by the physical attributes of the ingress port. However,~~ at the BS and SS ~~in the uplink direction~~, the service shall be policed to conform to this parameter, on the average, over time. ~~At the BS in the downlink direction, it may be assumed that the service was already policed at the ingress to the network and the BS is not required to do additional policing~~. If this parameter is omitted or set to zero, then there is no explicitly mandated maximum rate. This field specifies only a bound, not a guarantee that the rate is available. The algorithm for policing to this parameter is left to vendor differentiation and is outside the scope of the standard. SDUs which exceed the Maximum Sustained Traffic Rate may be either delayed or dropped according to the discretion of the vendor.

For uplink UGS Service Flows with fixed SDU size, the Maximum Sustained Traffic Rate determines the nominal time between data grants.

[Delete section 11.13.8]

[Modify section 11.13.9 as follows:]

11.13.9 Minimum reserved traffic rate

This parameter specifies the minimum rate reserved for this service flow. The rate is expressed in bits per second and specifies the minimum amount of data to be transported on behalf of the service flow when averaged over time. The specified rate shall only be honored when sufficient data is available for scheduling. ~~When insufficient data exists, the requirement imposed by this parameter shall be satisfied by assuring the the available data is transmitted as soon as possible.~~

~~The BS shall be able to satisfy bandwidth requests for a service flow up to its Minimum Reserved Traffic Rate.~~ If less bandwidth than its Minimum Reserved Traffic Rate is available ~~requested~~ for a service flow, the BS may reallocate the excess reserved bandwidth for other purposes. ~~The aggregate Minimum Reserved Traffic Rate of all service flows may exceed the amount of available bandwidth.~~ The value of this parameter is calculated from the byte following the MAC header HCS to the end of the MAC PDU payload. If this parameter is omitted, then it defaults to a value of 0 bits per second (i.e., no bandwidth is reserved for the flow).

[Modify 11.13.14 as follows:]

11.13.14 Maximum latency

The value of this parameter specifies the maximum latency between the ingress of a packet to the Convergence Sublayer reception of a packet by the BS or SS on its network interface and the forwarding of the packet to its RF Interface.

If defined, this parameter represents a service commitment (or admission criteria) at the BS or SS and shall be guaranteed by the BS or SS. A BS or SS does not have to meet this service commitment for service flows that exceed their minimum reserved rate.