Project	IEEE P802.16 Broadband Wireless Access Working Group		
Title	System Requirements Comments Received at Meeting #1		
Date Submitted	15 July, 1999		
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Re:	Chair/Editor notes from meeting #1, posted as requested by the system requirements task group.		
Abstract	This document is a capture of the written comments received by 802.16 attendees at meeting #1 in Montreal..		
Purpose	It's purpose is informational—to remind the submitters of their comments, and inform the members. The submitters should ensure that the editor has received the comments so that the task group can process them.		
Notice	This document has been prepared to assist the IEEE P802.16. 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 acknowledges and accepts that this contribution may be made publicly available by 802.16.		

Page #:	T/E	Submitter:	Comment:	Resolution:
	T	Robert Duhamel	Upstream contention is an issue for FDMA	
	T	Robert Duhamel	Adjacent channel interference	
		Robert Duhamel	Availability in access portion: POTS toll quality at least (G.826, F.1189)	
		Robert Duhamel	Guideline for service provider choice of rain model	
	T	Hossein Izadpanah	Add text for efficiencies of pico cells: Lower cost transceivers; up/down conv easier; reduced delay=better service;interference decreased; adaptive antennas; BTS complexity moved to central NOC; simpler management: centralized	
	T	Willie Lu	Base on packets: achieves dynamic channel allocation	
	T	Willie Lu	Open arch; FDD/TDD irrelvant due to reconfigurable system	
	T	Willie Lu	Contrib. Acheives high spectrum utilization	
	T	Willie Lu	Packet orientation only: IP/ATM & IP/wATM yeilds QoS guarantees all the way to the terminal	
	T	Willie Lu	International Applicability/Standard	
	T	Willie Lu	Contrib. Achieves lower station cost	
	T	Willie Lu	Contrib. Achieves software reconfigurability	
	T	David Jarrett	Not residential market [general comment]	
	T	David Jarett	Separate treatment for: Narrowband voice, voice/data trunking, Leased/Dedicated Services instead of lumping together 2.2.2: 3 new sections or subsections	
	T	David Jarrett	Do not include video distribution requirement; 2.2.1 should be removed	
	T	D. Jarrett	Call for more bearer service attributes to guide protocol requirements; Fill in section 6.3	Call for contribution
		D. Jarrett	802.16 should accept bearer services listed by D. Jarret: Narrowband Teleph, voice data trunking, leased circuits, routed IP, frame relay, 802.1 bridging	
			802.16 agnostic to impl. Technology: e.g., ATM & IP: support both [General comment]	
	T	M. Goldhammer	Addressing mode: frame structure: IEEE src/dst	
	T	M. Goldhammer	Protocol model: include layer 3 funcs: IWFs to service connection oriented protocols: connection control services	
	T	M. Goldhammer	More Detailed reference model w/ internal data and protocol flow	
	T	G. Fishel	Common access protocol: subscriber interfaces w/ hub; channel assignment	
	T	G. Fishel	PHY Req: Modulation	
	T	S. Marin	Toll quality attribute of voice bearer service (2.1, 2.2.2)	

	T	**S. Marin**	**Outside plant part of access network**	
	T	**S. Marin**	**Upstream star topology: Simultaneous model for multiple links; At any instant, one STS has access (e.g., w/ FDM or CDMA) (p 15)**	
	T	**S. Marin**	**Fixed; not mobile; ?transportable (2.1) (p. 14)**	
	T	**W. Myers**	**Use errored seconds (ES, SES, CER) rather than BER**	
	T	**W. Myers**	**Explicit allocation of delay budget. ?Sub-group needed?**	
	T	**W. Myers**	**ATM should not be a telephony bearer service**	
	T	**W. Myers**	**10E-9 BER not consistent w/ packet error rates for throughput using block FEC codes (802 requires BER; G.826 goes w/ errored seconds) 10E-9 much better than required for some bearer services.**	
	T	**W. Myers**	**Symmetry of service options not addressed**	
	T	**W. Myers**	**MAC should be agnostic**	
	T	**W. Myers**	**Rain model should be chosen (ITU, Crane, …)**	
	T	**W. Myers**	**Add telephony service: VoIP**	
		W. Myers	**Ask for discussion on delay**	**Call for contributions: Delay requirements cited by standards, etc.**
		W. Myers	**Ask for choice of terminology: errored seconds**	
	T	**J. Mollenauer**	**STM data can be carried w/out headers on each data unit (could be only one byte) (p. 26, sec 9: Re, use of 48 bit address, data units may have a smaller address that is actually used. ?Minimum burst size?**	
		J. Mollenauer	**Bearer services: term new to 802. Should talk about services that may require a convergence sub layer.; replace discussion of bearer services with discussion of convergence sublayers**	
		J.Mollenauer	**Diagram on p.17: DAV "wants" to be part of MAC. Combine DAV TC w/ MAC layer; DAV should not bypass the MAC layer**	
			Add IETF diffserv and MPLS	
	E	**Imed Frigui**	**Move system model to section 2**	
	T	**Imed Frigui**	**Broadband >~2 Mbps: sustained or peak? (p. 7, 20)**	
	E	**Imed Frigui**	**Remove "Expected Cost…" (p. 9, 20)**	
	T	**Imed Frigui**	**Sec. 2.2.1: remove (DAV wrong market)**	**[repeat]**
	E	**Imed Frigui**	**Remove "Cost Effective" (not a requirement)**	
	E	**Imed Frigui**	**Frame relay is packet-based, not circuit-based (p. 13)**	
	T	**Imed Frigui**	**Remove DVA (p. 18)**	
	T	**Imed Frigui**	**Availability is operator choice, not interop. Std. Choice (p. 20)**	
	T	**Imed Frigui**	**Local access metrics should account for 10-20% of end-to-end budget (p. 21)**	
	T	**Imed Frigui**	**CRC: header only or header + PDU? (p.21)**	
	T	**Imed Frigui**	**Need to be careful citing G.826: depends whether BER or PER can be achieved (p. 21)**	**Call for contrib: how does taking out 10E-9 affect our**

				802 standing?
	T	**Imed Frigui**	**19.5 msec too high for voice w/out echo canc.; need to be less than 12 msec (G.114 or G.17) (p. 22)**	
	T	**Imed Frigui**	**1.5 msec delay variation too high; should be <500 usec (ATM CES E-to-E is ???; DS0 is 250 usec & T1 ~1msec (p. 22)**	**Call for contrib: (in same as delay call)**
	T	**Imed Frigui**	**"dynamically signalled" means PVC or SVC? (p. 23) Need to be careful re: signaling reqs. For switched connections**	**Call for contribution: specific connection types: PVC/SVC**
	T	**Imed Frigui**	**ATM Service GF (Guaranteed Frame) or UBR+ (p. 24)**	**Imed will supply text**
	T	**Imed Frigui**	**Diffserv: Assured services, etc. (p. 24)**	**Imed will supply text**
		I. Frigui	**Investigate particular requirements of Ipv6**	**Call for contribution**
	E	**Imed Frigui**	**IEEE may be moving to 64 bit address**	
	T	**Imed Frigui**	**"Password and secrets…"; what does "encrypted" mean? What Key?**	
	T	**G. Robinson**	**Provide guidelines for parameters that support an interoperable air interface (1.0)**	
	T	**G. Robinson**	**Issue w/ definition of system?? (1.1)**	
	T	**G. Robinson**	**Broadband (>~2 Mbps) difficult to say, considering future markets/applications**	
	T	**G. Robinson**	**Maintain flexibility for full range of capability (i.e. fractional T1's (Figure 2.2), sec. 2.1**	
	T	**G. Robinson**	**Need allow POTS service as part of the systems capabilities and protocols. (2.2.2)**	
	T	**G. Robinson**	**MAC/PHY needs to explicitly address "Other Services:" back-haul, virtual point-to-point; frame relay (2.2.6)**	
	T	**G. Robinson**	**System requirements need to address both ATM and IP (i.e., MAC/PHY shall be capable of…) (2.2.3)**	**Call for contribution: For inclusion of IP in addition to ATM (specifically address IP)**
	T	**G. Robinson**	**Total network should be known when multiple cells exist in an LMDS deployment and 802.16 should address the parameters necessary for the LMDS deployment (network) in a BTA (for example) with external network interfaces also shown.**	
	T	**G. Robinson**	**Objection to "Protocols are the heart of the 802.16…"; necessary but not sufficient – broadband wireless requires that major attention be paid toe air interface parameters/characteristics**	
	T	**G. Robinson**	**Definition of customer/service model is needed to support availability definition (5.4)**	
	T	**G. Robinson**	**Different BER for different types of service (5.4)**	
	T	**G. Robinson**	**Reformat document from "narrative" form to "requirements" form: shall, will, etc.**	

	T	**F. Chitayat**	**Air interface should include a repeater (system reference model)**	**Call for task group (in context of current PAR?)**
	T	**S. Marin**	**Add "Preliminary Workin Draft" to title**	
	E	**S. Marin**	**Spell out MAC/PHY acronymns (1)**	
	T	**S. Marin**	**Delete "is not binding"; "precedence" statements (1)**	
	T	**S. Marin**	**Constitutes -> "contains" (1.1, 3)**	
	E	**S. Marin**	**Spell out BW (1.1)**	
	T	**S. Marin**	**Reflect other upper layers in 1st figure**	
	T	**S. Marin**	**"costs may be too high"…delete (too negative)**	
	E	**S. Marin**	**Replace "low thoughput voice-based" w/ "highly compressed voice-based" (2.1)**	
	E	**S. Marin**	**LAN/PBX = "outside plant" (2.1)**	
	E	**S. Marin**	**Spell "premises" not "premise"**	
	T	**S. Marin**	**Delete "However…may not cost effectively…dubious…" too negative**	
	T	**S. Marin**	**802.16 can transport compressed voice such as cellular or PCS but primary "focus?" is toll or wireline quality voice POTS. (2.2.2 prior to "as mentioned"**	
	T	**S. Marin**	**"or multiples thereof" => "fractions or multiples thereof"**	
	T	**S. Marin**	**Delete "best effort delivery"; no QOS?**	
	T	**S. Marin**	**?Network element? (3)**	
	E	**S. Marin**	**Equate Hub, Base Station to BTS**	
	E	**S. Marin**	**Equate Subscriber, sub, sub terminal**	
	E	**S. Marin**	**Spell out P-MP (p 14)**	
	T	**S. Marin**	**"separate 802.16 networks" => "separate network elements" (p 14)**	
	T	**S. Marin**	**Mention block band assignment by regulatory agency (p. 14)**	
	T	**S. Marin**	**Freq. Agility RQMT to optimize to local market and react to interference on some channels**	
	E	**S. Marin**	**Left to right or right to left? (figure 3-3)**	
	T	**M. Shahar**	**Eliminate STM and ATM from sysreq:** The following is a general comment regarding the system requirement document. Recognizing that IP based services are evolving very fast, many people expect IP to become a common platform for all services and that the need for legacy STM services as well as ATM services will be eliminated. Example of standard bodies that has adopted already this approach are MCNS DOCSIS and IEEE802.14. It seems that if this approach is acceptable in the case of cable operators it should be acceptable to wireless operators as well. It is therefore suggested to eliminate STM and ATM from the standard or at least create two different MAC schemes within the IEEE802.16 standard, one of which will be optimized for IP based services and will be based on the DOCSIS1.1 standard with the appropriate wireless modifications.	**Call for contribution/Compromise**
	T	**C. Cant**	**Use of Repeaters**	

	E	**C. Cant**	**Clarify scope: Terrestrial (non satellite) High altitude platforms? Fixed only**	
	T	**C. Cant**	**Is it valid to consider only "Single BTS?" What about interaction (dynamic assignments between BTSs)?**	
	T	**C. Cant**	**Should we attempt to scope max user traffic, traffic density, asymmetry, variability of asymmetry (see ETSI TR?); quantitative information?**	
	E	**C. Cant**	**Check that terminology does not conflict with ITU 8A/9B "vocabulary"**	
	E	**Genzao Zhang**	**Fractional T1/E1 may need to be mentioned in BA service list supported**	
	E	**G. Zhang**	**The service B/W in bit rate may be addressed separately for P-P & P-MP subsystems**	
	E	**G. Zhang**	**Say clearly the B/W in Bit Rate is per RF carrier**	
	T	**G. Zhang**	**In the IP-related delay calculation/estimation, the upstream delay due to over-the-air traffic management should be counted.**	
	T	**G. Zhang**	**Synchronization requirement (8KHz) for T1/E1 (ATM CES) should be addressed**	
	T	**G.Zhang**	**Shall mention any requirements on inter-BWA-Network**	
	G	**D. Jarrett**	In the interest of speed, the editor took the liberty of adding text to the System requirements draft, either 1) based on contributions that had not been discussed, or 2) based on discussion that was not reflected in a contribution. The content of the System Requirements document (and 802.16 documents in general) should strictly be based on contributions that have been discussed and result in agreed changes to the document.	Re-address/re-affirm procedures.
2.2.2			When add specific section for Voice/Data Trunking (instead of PBX trunking as in 802.16sc-99/18), add requirement that PDH (T1/E1/T3/E3) timing must be carried through the BWA transparently, with TBD jitter, wander, …	Add text, call for contribution on specifics
5.4			Should add text saying system should support/not preclude variable availability/bitrate per link	Call for contribution
5.4			Should clarify whether discussing air availability, or link availability (which should include equipment availability)	Clarification by author
9			Should not specify 802 conformance in System Requirements document – this should be fully addressed by MAC group	Route original contribution (802.16sc-99/16?) to the MAC working group
2.1	**E**		Should Say "BWA *may* also address broadband network access for the single family, …"	Change current text
Fig. 2-2	**E**		Remove 802.16 as a solution for Tier III Mass Market Access	Change current text
2.2.1	**T**		Do not address video multicast	Remove text
2.2.2	**E**		Remove discussion of ATM as the way to carry TDM – this is a possible solution that should be determined elsewhere, not a requirement	Remove text

2.2.4	**E**		Shouldn't mention that 802.16 services tuned for ATM. Entire discussion not appropriate for service requirements discussion	Remove text
3.0, p. 2	**E**		Interoperability PAR adds that overall frequency range is 10-66 GHz – should be reflected here	Add to current text
3.0, P4, bullet 2-3	**E**		Not appropriate in requirements discussion – these are MAC/Phy issues that have not yet been addressed, let alone decided	Remove text
3.2, p. 2	**E**		Discussion is FDD-based, which has not been accepted yet	Remove Text
Fig. 4-1	**E**		Should adopt figure such as Figure 1 in 802.16sc-99/7, which directly addresses IP and FR (and could have Ethernet added) instead of just LLC	Change figure
6.2, P1, bullet 4	**E**		Should be Minimum Cell Rate, the minimum rate ffor an ABR connection, not Maximum Cell Rate for the link	Change Text
5.2		**J. Mollenauer**	Sec. 5.2; delete first paragraph	
5.6		**J. Mollenauer**	Change "Suggested" to "shall" (sec. 5.6)	
2.1		**R. Sanders**	BWA systems not meant to compete…; change to "not meant to focus	
			Error rate on per-channel basis	
			Section 6: shouldn't presume bandwidth management is a layer 3 or 4 issue.	