Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**802.16.3 Functional Requirements Comments for Session #8**
Date Submitted	**2000-07-09**
Source(s)	Brian Petry 3Com 12230 World Trade Dr. San Diego, CA 92128 Voice: 858-674-8533 mailto:brian_petry@3com.com
Re:	802.16.3 Functional Requirements Comment Database Report for Session #8.
Abstract	This is a database dump of unresolved comments. The database is sorted by page number, then line number. Note that the report includes comments that were left unresolved following session #7. The left-over comments refer to document 802.16.3-00/02r1, whereas the new comments received refer to 802.16.3-00/02r2.
Purpose	The 802.16.3 Functional Requirements Task Group should use this report to assist in the comment resolution meetings at session #8.
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Unresolved Comments by Page #/Line#

Page/Line: 1 /5 **Number:** 182 **Date:** 7/10/00 **Name:** Nativ Adi **Type:** Technical

Description:
Delete: "packet-based"

Reason **Resolution:** unresolved
To allow support of non packet-based services in addition to pocket based.

Notes:

Page/Line: 1 /5 **Number:** 186 **Date:** 7/10/00 **Name:** Padan Uzi **Type:** Technical

Description:
Delete "packet based" or replace "packet based" with "packet based or circuit switching based"

Reason **Resolution:** unresolved
There is no need to limit the services and solutions to pure packets. There is a need to enable compatibility with legacy networks.

Notes:

Page/Line: 1 /5 **Number:** 190 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Technical

Description:
Move the words "packet-based" to between the words "provides" and "transport", so that the sentence reads: "The BWA system provides packet-based transport capabilities that can support a wide range of services...."

Reason **Resolution:** unresolved
To clarify that it is the transport that is packet-based - the services can be anything.

Notes:

Page/Line: 1 /7 **Number:** 180 **Date:** 7/10/00 **Name:** Nativ Adi **Type:** Editorial

Description:
Erase one of two dots after "locations".

Reason **Resolution:** unresolved
typing error, one dot too much.

Notes:

Page/Line: 2 /2 **Number:** 191 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Technical

Description:
Replace "services" by "services capabilities"

Reason **Resolution:** unresolved
To generalize the field of application of the 802.16.3 systems. We need to focus on services capabilities so that operators may build services according to their own market requirements.
Was comment # 149 in last round - Editor said it couldn't be located.

Notes:

Page/Line: 2 /3 **Number:** 192 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Technical

Description:
Replace "services" by "services capabilities"

Reason **Resolution:** unresolved
To generalize the field of application of the 802.16.3 systems. We need to focus on services capabilities so that operators may build services according to their own market requirements.
Was comment # 149 in last round - Editor said it couldn't be located.

Notes:

Page/Line: 2 /10 **Number:** 193 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Technical

Description:
Add a new sentence: "As far as possible, these should be common across the 802.16 systems."

Reason **Resolution:** unresolved
Commonality improves efficiency.

Notes:

Page/Line: 2 /21 **Number:** 194 **Date:** 7/10/00 **Name:** Costa Jose **Type:** Editorial

Description:
After "The access standards define" please insert "the ways to use"

Reason **Resolution:** unresolved
Standards do not define technology by rather the way technology is used (e.g., techniques)..

Notes:

Page/Line: 2 /23 **Number:** 195 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Technical

Description:
Delete the sentence "Other types are under investigation."

Reason **Resolution:** unresolved
Doesn't add anything to the requirements, unless this investigation will be concluded before the FRs are complete.

Notes:

Page/Line: 3 / 21 **Number:** 196 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Editorial
Description:
Add a reference for the "Five Criteria"
Reason **Resolution:** unresolved
Improve readability/understanding.

Notes:

Page/Line: 4 /13 **Number:** 198 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Technical
Description:
Modify the sentence to read: "Radio communication in the above range may be possible even in near- and non-line-of-sight situations between a base station and subscriber station."
Reason **Resolution:** unresolved
Clarify the sentence.

Notes:

Page/Line: 4 /13 **Number:** 197 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Technical
Description:
Insert the original sentence after the word "protocols": "Specific applications of the 802.16.3 point-to multipoint (P-MP) radios include 2.1 to 3.5 GHz, but the standard is more generally applicable to the range from 2 to 11 GHz."
Reason **Resolution:** unresolved
Without this sentence that has the frequency range (which was deleted at the meeting #7), the words "in the above range .." in the sentence beginning on line 14 have no meaning.

Notes:

Page/Line: 4 /13 **Number:** 183 **Date:** 7/10/00 **Name:** Nativ Adi **Type:** Editorial
Description:
Define the range instead of stating: "the above range".
Reason **Resolution:** unresolved
No range is mentioned "above" in that section.

Notes:

Page/Line: 4 /19 **Number:** 187 **Date:** 7/10/00 **Name:** Padan Uzi **Type:** Editorial
Description:
Change "regulatory and atmospheric conditions" to " local regulations and atmospheric conditions"
Reason **Resolution:** unresolved
Those are totally different issues and should be separated

Notes:

Page/Line: 7 /18 **Number:** 65 **Date:** 4/28/00 **Name:** Kasslin Mika **Type:** Technical
Description:
Delete lines 18 to 21: "The consumer" through "services)"
Reason **Resolution:** unresolved
The statement does not provide any valuable information.

Notes:

Page/Line: 7 /25 **Number:** 199 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Technical
Description:
Replace the words "means to multiplex traffic to and from multiple subscriber stations" by "means to multiplex traffic from multiple subscriber stations"
Reason **Resolution:** unresolved
This sentence is addressing the upstream direction only.

Notes:

Page/Line: 7 /25 **Number:** 66 **Date:** 4/28/00 **Name:** Kasslin Mika **Type:** Technical
Description:
Delete the entire subsection 3.1.1.1
Reason **Resolution:** unresolved
These statements here add nothing but fluff. The requirements for telephony services are sufficiently dealt with in the QoS section. The statement before this subsection already refers there, so there's no need to repeat that here without any hard values.

Notes:

Page/Line: 7 /28 **Number:** 200 **Date:** 7/10/00 **Name:** Costa Jose **Type:** Technical
Description:
Propose to replace the title and first paragraph with:

3 Supported Service Capabilities

This section describes typical service capabilities supported by an 802.16.3 air interface.
Reason **Resolution:** unresolved
To generalize the field of application of the 802.16.3 systems. We need to focus on services capabilities so that operators may build services according to their own market requirement.

Notes:

Page/Line: 7 / 29 **Number:** 201 **Date:** 7/10/00 **Name:** Costa Jose **Type:** Technical

Description:
In the sentence starting "In this document, services refer.....", change the word "document" to "section", and move the sentence to page 9 line 15 , just before "IEEE 802 protocols...."

Reason This service definition belongs in the Protocols section. **Resolution:** unresolved

Notes:

Page/Line: 7 /29 **Number:** 16 **Date:** 4/28/00 **Name:** Freedman Avi **Type:** Technical

Description:
change "will be provided by VoIP" to "might be provided by VoIP"

Reason See above. **Resolution:** unresolved

Notes:

Page/Line: 7 /29 **Number:** 113 **Date:** 4/28/00 **Name:** Satapathy Durga **Type:** Editorial

Description:
Delete the sentence
"Voice connectivity will be provided by a VOIP protocol and may involve low rate vocoding."

Reason See no need to limit voice services to VOIP. **Resolution:** unresolved

Notes:

Page/Line: 7 /32 **Number:** 25 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Technical

Description:
Insert after business). "The required bandwidth is minimized with VoIP, the associated codecs providing a very good compression: 8kb/s for G.729, 6.3kb/s for G.723. The compression result is the increase of the delay.

Reason To make clear what is VoIP rate **Resolution:** unresolved

Notes:

Page/Line: 7 /34 **Number:** 27 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Technical

Description:
Change "MUST" with "SHOULD"

Reason The delay amount is depending on many factors, the MAC being only one of them.The delay amount, due to echo cancellers used with VoIP, is not extremly critical. **Resolution:** unresolved

Notes:

Page/Line: 7 /34 **Number:** 99 **Date:** 4/28/00 **Name:** Kostas Demosthenes **Type:** Technical

Description:
-second bullet, should be modified to read,

"Delay - as apparent to the end user, the amount of delay and delay variation
MUST be kept within acceptable limits. Again the specific amount of delay and delay variation acceptable is based on the QoS sold to the end user."

Reason To include delay variation and improve English **Resolution:** unresolved

Notes:

Page/Line: 7 /34 **Number:** 26 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Editorial

Description:
Delete"low"

Reason The VoIP delay is not low **Resolution:** unresolved

Notes:

Page/Line: 7 /36 **Number:** 28 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Technical

Description:
Insert after the conversation. "The QoS requiremets should take into account the characteristics of the VoIP technology: codec end-to-end delay of 50ms for 10ms frame (G.729), 120ms for 30ms frame (G.723), the possibility to transmit concatenated voice packets, the mandatory use of echo cancellers.

Reason Give a feeling of what VoIP delay is **Resolution:** unresolved

Notes:

Page/Line: 7 /38 **Number:** 202 **Date:** 7/10/00 **Name:** Costa Jose **Type:** Technical

Description:
Propose to replace the title and first paragraph with:

3.1 Voice Transport Service Capabilities

802.16.3 systems SHALL support voice communications to subscribers in a way that eases the migration of legacy voice equipment and public switched telephone network (PSTN) access technologies to 802.16.3 systems. The 802.16.3 access transport will be packet based (as opposed to circuit switched) and voice communication will be transported by means of packets.

Reason **Resolution:** unresolved
To generalize the field of application of the 802.16.3 systems. We need to focus on services capabilities so that operators may build services according to their own market requirement.

Notes:

Page/Line: 7 /39 **Number:** 29 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Technical

Description:
Insert new paragraph with bullet: BER level The MAC and PHY protocols SHOULD provide for a reasonable BER Level for voice services. BER of 10-4 is sufficient for voice services and 10-5 for FAX.

Reason **Resolution:** unresolved
Make clear the BER issue

Notes:

Page/Line: 7 /41 **Number:** 188 **Date:** 7/10/00 **Name:** Padan Uzi **Type:** Technical

Description:
Delete the sentence "The access transport will be packet based (as opposed to circuit switched) and voice serivces will be recovered form the packets"

Reason **Resolution:** unresolved
There is no need to limit the services and solutions to pure packets. Enabling circuit switched as an option will ease the migration from legacy networks, as mentioned in a previous sentence.

Notes:

Page/Line: 7 /41 **Number:** 184 **Date:** 7/10/00 **Name:** Nativ Adi **Type:** Technical

Description:
Delete sentence: "The access transport will ... recovered from the packets".

Reason **Resolution:** unresolved
To allow non-packet based services in addition.

Notes:

Page/Line: 8 /43 **Number:** 203 **Date:** 7/10/00 **Name:** Costa Jose **Type:** Technical

Description:
Propose to replace the title and first paragraph with:

3.2 Data Transport Service Capabilities - Internet

The 802.16.3 system MUST directly transport variable-length datagrams efficiently. Both IP versions 4 and 6 must be supported. For efficient transport of IPv6, TCP/IP header compression over the air interface SHOULD be supported. The 802.16.3 IP service MUST provide support for real-time and non-real-time service capabilities. It SHOULD be possible to support the emerging IP Quality of Service (QoS) efforts: Differentiated Services [43, 44] and Integrated Services [42].

Reason **Resolution:** unresolved
To generalize the field of application of the 802.16.3 systems. We need to focus on services capabilities so that operators may build services according to their own market requirement.

Notes:

Page/Line: 9 /5 **Number:** 204 **Date:** 7/10/00 **Name:** Costa Jose **Type:** Technical

Description:
Propose to replace the title and first paragraph with:

3.3 Bridged LAN Service Capabilities

The 802.16.3 protocols SHOULD support bridged LANS service capabilities, whether directly or indirectly, including always on, ad hoc and on-demand communication in either or both directions.

Reason **Resolution:** unresolved
To generalize the field of application of the 802.16.3 systems. We need to focus on services capabilities so that operators may build services according to their own market requirement.

Notes:

Page/Line: 9 /23 **Number:** 181 **Date:** 7/10/00 **Name:** Nativ Adi **Type:** Editorial

Description:
Insert line 23 before line 19

Reason **Resolution:** unresolved
Title should be attached to the figure.

Notes:

Page/Line: 10 /16 **Number:** 34 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Technical

Description:
Insert paragraph 6 Wireless media characteristics
Sub-paragraph 6.1 Duplex model
Paragraph start The radio regulations permit two access modes: Frequency Division Duplex - FDD and Time Division Duplex - TDD. The MAC and PHY protocol MUST support both FDD and TDD duplex modes. Spectral efficiency is maximized in FDD with full-duplex operation, while in TDD with means to avoid collocation problems and more complex interference scenarios. The PHY and MAC protocols MUST provide for full duplex operation, while preserving the QoS, BER and spectral efficiency requirements for data and voice traffic. The MAC and PHY protocols MUST provide means to resolve the collocation and interference problems in TDD deployment.

Reason
Missing paragraph

Resolution: unresolved

Notes:

Page/Line: 10 /16 **Number:** 35 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Technical

Description:
Insert paragraph 6.2 Channelization
New paragraph The standardization bodies providing channelization recommendations are ITU-R, CEPT and FCC. The allocated bandwidth per operator varies between 5MHz and 120MHz. In Europe, the typical allocated bandwidth is 14MHz. The operators target a good frequency reuse factor, using 4-6 sectors for Base Stations.The Base Station bandwidth per sector can be between 1.75MHz and 7MHz in in CEPT countries and between 2MHz and 6MHz in MMDS. The MAC and PHY protocols MUST permit the operation with channel spacing per sector of 1.75, 3.5 and 7MHz when using ETSI masks and 2, 3, 5 and 6MHz when using other masks. The typical value for performance analysis SHOULD be 3.5MHz for ETSI mask and 3MHz for MMDS mask.

Reason
Missing paragraph

Resolution: unresolved

Notes:

Page/Line: 10 /16 **Number:** 36 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Technical

Description:
Insert paragraph 6.3 Cellular deployment
New paragraph In cellular deployment, due to interference, the system spectral efficiency can be considerably lowered. The PHY and MAC protocols SHOULD permit good frequency reuse factors, providing at least 2bit/s/cell.In order to reduce the interference level, the PHY and MAC protocols MUST permit power control per subscriber up-link and SHOULD permit power control per subscriber down-link. The PHY and MAC protocols SHALL permit real-time changing of power levels, as function of propagation conditions, in order to use the minimum power needed for the target BER.

Reason
Missing paragraph

Resolution: unresolved

Notes:

Page/Line: 10 /30 **Number:** 33 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Editorial

Description:
Replace "Bandwidth" with "Capacity"

Reason
Bandwidth is measured in Hz, not bit/s

Resolution: unresolved

Notes:

Page/Line: 10 /32 **Number:** 189 **Date:** 7/10/00 **Name:** Freedman Avi **Type:** Technical

Description:
Replace "rapidly changing" with "diverse"

Reason
The channels in fixed wireless access are not rapidly changing in time. They may slowly change, however the key issue is that each link is different.

Resolution: unresolved

Notes:

Page/Line: 10 /38 **Number:** 205 **Date:** 7/10/00 **Name:** Wachira Muya **Type:** Technical

Description:
Replace "(with references, etc.)" by "(Questions ITU-R 140/9, ITU-R 215/8, ITU-R 220/9)"

Reason
To provide more specific references.

Resolution: unresolved

Notes:

Page/Line: 12 /29 **Number:** 185 **Date:** 7/10/00 **Name:** Nativ Adi **Type:** Technical

Description:
Change first sentence in 5.7 to the following: "802.16.3 system was defined in section 2 to consist of one base station.
A 802.16.3 system capacity is therefore defined as the product of the number of sectors per base station and a sector capacity.
A sector capacity requirement is defined as the product of two factors: the "modulation-gain" factor and the "sector-bandwidth".
The "modulation-gain" is defined as the sector's aggregate bit rate devided by the bandwidth, depending mainly on the type of modulation in use.
The "sector-bandwidth" is defined as the total frequency band available for the BWA service, devided by the frequency re-use factor.
This reflects mainly the factor of frequency reallocation and the ability to optimize frequency useage."

Reason **Resolution:** unresolved
Capacity issues should consider matters such as modulation type and frequency reuse factor.

Notes:

Page/Line: 13 /1 **Number:** 19 **Date:** 4/28/00 **Name:** Freedman Avi **Type:** Technical

Description:
All reference should be revisitied

Reason **Resolution:** unresolved
Most of the reference are not releavant to 802.16.3

Notes:

Page/Line: 13 /21 **Number:** 38 **Date:** 4/28/00 **Name:** Goldhammer Marianna **Type:** Technical

Description:
Change from table the 10ms in row 7 to "1/4 of the VoIP codec end-to-end delay"

Reason **Resolution:** unresolved
Requirements non consistent with VoIP

Notes:

Page/Line: 13 /21 **Number:** 173 **Date:** 4/28/00 **Name:** Wachira Muya **Type:** Technical

Description:
In Table 1 column 4 row 7 replace "10 ms " with "100 ms "

Reason **Resolution:** unresolved
Delay of 10 ms for packet-oriented connections is too short. VoIP can tolerate up to about 150 ms delay, as
long as frame error rate is below about 1%.

Notes:

Page/Line: 13 /25 **Number:** 18 **Date:** 4/28/00 **Name:** Freedman Avi **Type:** Editorial

Description:
Remove space within "T he"

Reason **Resolution:** unresolved
Typo

Notes:

Page/Line: 14 /20 **Number:** 107 **Date:** 4/28/00 **Name:** Kostas Demosthenes **Type:** Technical

Description:
Change Sentence to read
"The 802.16.3 protocols SHALL define a set of parameters to meet the required
QoS parameters for the supported services (e.g., ATM CBR Services and IP) "

Reason **Resolution:** unresolved
To include the support of additional services

Notes:

Page/Line: 14 /32 **Number:** 108 **Date:** 4/28/00 **Name:** Kostas Demosthenes **Type:** Technical

Description:
The last sentence parenthesis should read
(such as those required for IP- and ATM-based services)

Reason **Resolution:** unresolved
To include the support of additional services to IP

Notes:

Page/Line: 15 /3 **Number:** 147 **Date:** 4/28/00 **Name:** Trinkwon David **Type:** Technical

Description:
Replace "CMIP/CMIS" with SNMP/CORBA

Reason **Resolution:** unresolved
More appropriate for Access networks / environments, especially for residential and SME markets

Notes:

Page/Line: 15 /15 **Number:** 142 **Date:** 4/28/00 **Name:** Trinkwon David **Type:** Technical

Description:
This needs further elaboration / discussion / contribution. Power control loops are probably fundamental for most FWA / customer unit applications and it must
not be possible to exceed a maximum permitted power level. Also, if a SU is "shut down" it must be possible to re-enable it (without visiting the customer location) to diagnose and fix / dispatch etc. There are also functions necessary
to handle Primary / secondary power conditions, software downloads/ upgrades,
perfotmance and error statistics, and to re-ptogram the allowed base station /

Reason **Resolution:** unresolved
Expand the requirement to better match the needs of the 802.16.3 target markets.

Notes:

Page/Line: 15 /27 **Number:** 143 **Date:** 4/28/00 **Name:** Trinkwon David **Type:** Technical

Description:
Needs further expansion / contribution to handle installation, service suspend/resume, relocation, geolocation and anti-cloning processes.

Reason **Resolution:** unresolved
To better match the needs for the 802.16.3 target markets.

Notes:

Page/Line: 17 /8 **Number:** 148 **Date:** 4/28/00 **Name:** Trinkwon David **Type:** Technical

Description:
Delete 2nd, 3rd and 4th bullets relating to 802 conformance.

Reason **Resolution:** unresolved
Not relevant / practicable for FWA/BWA applications for residential and SME markets.

Notes:

Page/Line: 17 /21 **Number:** 176 **Date:** 4/28/00 **Name:** Wachira Muya **Type:** Editorial

Description:
Replace the term "bandwidth " with " capacity"

Reason **Resolution:** unresolved
Referring to capacity as "bandwith" is colloquial usage, and we should use the correct terms - bandwidth
expressed in Hz and capacity in bit/s or bps.

Notes:

Page/Line: 22 /0 **Number:** 75 **Date:** 4/28/00 **Name:** Kasslin Mika **Type:** Editorial

Description:
Delete the last incomplete sentence "This" through "provisioning"

Reason **Resolution:** unresolved
Useless and misleading sentence

Notes:

Page/Line: 22 /0 **Number:** 76 **Date:** 4/28/00 **Name:** Kasslin Mika **Type:** Editorial

Description:
Delete "Protocol" till end of text

Reason **Resolution:** unresolved
Incomplete and irrelevant sentence

Notes:

Page/Line: 25 /0 **Number:** 77 **Date:** 4/28/00 **Name:** Kasslin Mika **Type:** Technical

Description:
Replace 99.94% with 99.95%

Reason **Resolution:** unresolved
Consistency with the text in section 5.4 if the corresponding earlier comment is approved.

Notes:

Page/Line: 26 /0 **Number:** 78 **Date:** 4/28/00 **Name:** Kasslin Mika **Type:** Technical

Description:
Delete the following bullet points:
"- Radio range (shaped sector radius)"
"- Width of the sector"

Reason **Resolution:** unresolved
Consistency with the text in section 5.7 if the corresponding earlier comment is approved.

Notes: